



U.S Army Corps of Engineers

New England Division

FINAL ENVIRONMENTAL ASSESSMENT REPORT **SUMP ROOM AT BARNES BUILDING**

BARNES BUILDING BOSTON, MASSACHUSETTS MADEP RTN #3-13806

Prepared Under:

DELIVERY ORDER NO. 0024 CONTRACT NO. DACW33-94-D-0007.

MAY 1997



Stone & Webster



Form Agentined REPORT DOCUMENTATION PAGE COMD No. 0704-0122 pts: 1388, Arthrophy, VA 22362-4393, and to Une Off 1. AGENCY USE ONLY (Leave Mank) [2. SEPORT DATE I. REPORT TYPE AND DAYER COVERED May 1997 Environmental Assessment A TITLE AND SUSTITUE . FUNDING NUMBERS Final Environmental Assessment Report - Sump Room Contract No. DACW33-94-D-0007 at Barnes Building Delivery Order No. & AUTHORIST Stone & Webster Environmental Technology & Services T. PERFORMING GREANIZATION NAME(S) AND ACCRESSIES) PERFORMING CREAKER FICH 245 Summer St. Boston, MA 02210 N/A S. SPONSORING / MONITORING AGENCY MAME(S) AND AGGRESS(ES) LICHTOMACAINS/MONITORING AMERICY REPORT RUMBER USACOE-NED 424 Trapelo Road Building 112S N/A Waltham, MA 02554 11 SUPPLEMENTARY NOTES N/A 124 DISTRIBUTION / AVAILABILITY STATEMENT 128. DISTAIGUTION COOL Unlimited UNLIMITED 13. ABSTRACT (Mesimum 200 words) This Environmental Assessment Report describes the methods and results of the Environmental Assessment conducted at the Barnes Building, located in Boston MA. Sump water and air samples were collected. The following conclusions were drawn: All volatile compounds detected in air for which OSHA and/or NIOSH standards exist are present at concentrations at least three orders of magnitude below the 8-hour time weighted average (TWA) concentrations for industrial settings published by NIOSH and/or OSHA. The groundwater sump discharges to a combined sewer in Inman St. The discharge of a stormwater (groundwater falls under this BWSC defined term) sump is permitted by BWSC regulations given the absence of a storm sewer to tie the discharge into. Since no storm sewer is present under Inman St., this discharge should be allowed by BWSC. The groundwater sump discharge meets both MWRA and BWSC influent standards for all compounds analyzed, with the exception of napthalene, which is present at a concentration well below the Massachusetts Drinking Water standards. The concentration of Total Petroleum Hydrocarbons on the oil-side of the sump oil/water separator (250 ppm) exceeds the GW-3 standard of 50 ppm. No current MCP standards are exceeded on the water (discharge) side of the sump. TA. SUBJECT TERMS 15. PAIRCELL OF PAGES Environmental Assessment, Air Sampling, Groundwater, TA PAGE COM Sump Water 18. SPOURITY CLASSIFICATION OF ABSTRACT 20. LIMETA THEM OF ASSERACE 17. SECURITY CLASSIFICATION 18 SECURITY CLASSIFICATION

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BARNES BUILDING BOSTON, MASSACHUSETTS MADEP RTN #3-13806

Prepared for:

Department of the Army New England Division, Corps of Engineers Waltham, Massachusetts

Prepared by:

Stone & Webster Environmental Technology & Services Boston, Massachusetts

CONTRACT NUMBER:

DACW33-94-D-0007 Delivery Order No. 24

MAY 1997

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FINAL

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TABLE OF CONTENTS

Section	Title	Page No.
1. 0 EXECUTIVE SUM	IMARY	1-1
2. 0 GENERAL		2-1
2.1 Introduction		2-1
2.2 PROJECT OBJECTIVES		2-1
2.3 SITE LOCATION, PHY	siography, Ownership and Prior Land Use	E 2-2
2.4 BACKGROUND		2-3
3. 0 SITE INVESTIGA	TION	3-1
3.1 Introduction		3-1
	ION	
3.3 AIR SAMPLING PROGI	RAM	3-2
	P SAMPLING PROGRAM	
3.5 Investigation-Deri	VED WASTE MANAGEMENT	3-7
4. 0 LABORATORY A	NALYTICAL RESULTS	4-1
4.1 Introduction		4-1
	SAMPLING RESULTS TO SCREENING LEVELS	
	OUNDWATER SUMP RESULTS TO SCREENING LEV	
	ESULTS	
5. 0 REGULATORY O	COMPLIANCE REVIEW	5-1
6. 0 CONCLUSIONS A	ND RECOMMENDATIONS	6-1
6.1 Conclusions	,	6-1

i

FINAL ENVIRONMENTAL ASSESSMENT REPORT SUMP ROOM AT BARNES BUILDING BARNES BUILDING BOSTON, MASSACHUSETTS MADEP RTN #3-13806

TABLE OF CONTENTS

(continued)

Section Title

GLOSSARY OF ACRONYMS AND ABBREVIATIONS

REFERENCES

FIGURES

TABLES

APPENDICES

APPENDIX A - VISUAL SITE INSPECTION REPORT
APPENDIX B - AIR SAMPLING ANALYTICAL DATA

APPENDIX C - GROUNDWATER SUMP ANALYTICAL DATA APPENDIX D - LABORATORY DATA VALIDATION REPORTS

APPENDIX E - FIELD SAMPLING DATA SHEETS

May 1997 ii

FINAL ENVIRONMENTAL ASSESSMENT REPORT SUMP ROOM AT BARNES BUILDING BARNES BUILDING BOSTON, MASSACHUSETTS MADEP RTN #3-13806

TABLE OF CONTENTS

(continued)

LIST OF FIGURES

Title

LIST OF TABLES			
Table	Title		
4-1	Barnes Building Air Sampling Results - Positive Occurrences of Identified Volatile Organic Compounds		
4-2	Barnes Building Basement Sump Water Analytical Results - Oil & Grease and Total Petroleum Hydrocarbons		
4-3	Barnes Building Basement Sump Water Analytical Results - PCB/Pesticides		
4-4	Barnes Building Basement Sump Water Analytical Results - Total Metals		
4-5	Barnes Building Basement Sump Water Analytical Results - Extractable Petroleum Hydrocarbons (EPH)		
4-6	Barnes Building Basement Sump Water Analytical Results - Volatile Petroleum Hydrocarbons (VPH)		
4-7	Barnes Building Basement Sump Water Analytical Results - Volatile Organics		
4-8	Barnes Building Basement Sump Water Analytical Results - Field Water Quality Measurements		

Site Location Map - Barnes Building

Barnes Building Sump Room

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Figure

2-1 2-2

1.0 EXECUTIVE SUMMARY

This Environmental Assessment Report (EAR) describes the methods and results of the Environmental Assessment (EA) conducted at the Barnes Building, located in Boston MA. This assessment of the environmental conditions at the sump room is a result of a site inspection by, and subsequent meeting with the Massachusetts Department of Environmental Protection, Bureau of Waste Site Cleanup, on 13 June 1996. There is an odor caused by suspected petroleum hydrocarbon contamination of ground water found at the sump.

Two water samples were collected from the building groundwater sump, one from the oil side of the oil/water separator in the sump and one from the water (discharge side of the sump. The objective of groundwater sampling conducted during this environmental assessment was to:

- determine the level of contamination in ground water at the sump;
- determine the location to which the sump is discharging;
- determine whether an immediate response action is required pursuant to Massachusetts Contingency Plan (MCP) Section 40.0411;
- provide recommendations of actions including permits necessary to bring the sump dewatering system into environmental compliance; and
- identify any permits or discharge/emissions requirements associated with the site and potential remediation activities.

Three air samples were collected in the basement of the Barnes building, one from the Sump Room with the ventilation system one, one from the Sump Room with the ventilation system off, and one sample was collected outside the Sump Room with the ventilation system off. The objective of the air sampling conducted during this environmental assessment is to determine if fuel-related contaminants suspected in groundwater at the sump and beneath the building are impacting air quality within the building.

The following conclusions were drawn from the Environmental Assessment:

All volatile compounds detected in air for which OSHA and/or NIOSH standards exist are present at concentrations at least three orders of magnitude

below the 8-hour time weighted average (TWA) concentrations for industrial settings published by NIOSH and/or OSHA.

The Barnes Building Sump is currently not in compliance with BWSC regulations.

The groundwater sump discharges to a combined sewer in Inman St. The discharge of a stormwater (groundwater falls under this BWSC defined term) sump is permitted by BWSC regulations given the absence of a storm sewer to tie the discharge into. Since no storm sewer is present under Inman St., this discharge should be allowed by BWSC. The sump is not, however a metered flow.

The groundwater sump discharge meets both MWRA and BWSC influent standards for all compounds analyzed, with the exception of napthalene, which is present at a concentration well below the Massachusetts Drinking Water standards. The oil-side of the groundwater sump contains both a thin (approximately 1/8 inch thick) layer of floating, separate phase liquid and a layer (approximately 4 inches thick)of black, oily sludge at the oil/water separator. The concentration of Total Petroleum Hydrocarbons on the oil-side of the sump oil/water separator (250 ppm) exceeds the GW-3 standard of 50 ppm.

No current MCP standards are exceeded on the water (discharge) side of the sump. The sump discharge (7 ppm) would exceed the proposed GW-3 and GW-2 TPH standards of 6 ppm and 2 ppm, respectively. The sump discharge also exceeds the proposed GW-2 EPH standards for C9-C18 aliphatics (sump discharge level is 2.1 ppm, C9-C18 aliphatic GW-2 limit is 1 ppm). The discharge side does not exceed any other proposed MCP limits. Should the proposed standards become regulation, the sump operation should not be effected given that the discharge is into the closed BWSC system at concentrations which meet both BWSC and MWRA permit standards, with the exception of napthalene, which is present at a concentration well below the Massachusetts Drinking Water Limit. The adoption of the new GW-2 standards will, however require action regarding the characterization and possible remediation of groundwater beneath the Barnes Building.

Recommendations for the Barnes Building Sump Room are as follows:

The BWSC should be made aware of this discharge and consulted as how this sump can be brought into compliance with their requirements.

Determine the discharge rate and frequency of operation of the sump in support of the BWSC permit application.

Pump out the oil side of the oil/water separator in the building sump to remove the floating separate phase liquid and oily sludge present. This material should be disposed of in compliance with federal, state and local regulations by a licensed waste hauler.

Continue the use of the lock on the sump room door to restrict unauthorized access to the sump room. Consider posting a sign prohibiting the discharge of any liquids into the sump.

Continue the operation of the building ventilation system to reduce the amount of nuisance odors present in the sump room.

2.0 GENERAL

2.1 Introduction

This Environmental Assessment Report (EAR) describes the methods and results of the Environmental Assessment (EA) conducted at the Barnes Building, located in Boston, MA. This assessment of the environmental conditions at the sump room is a result of a meeting with the Massachusetts Department of Environmental Protection, Bureau of waste Site Cleanup, on 13 June 1996. The work described herein was performed and this report has been prepared by Stone & Webster Environmental Technology & Services (Stone & Webster) under Contract Number DACW33-94-D-0007 for the U.S. Army Corps of Engineers, New England Division (USACE-NED). This EAR presents the results of work performed in accordance with the directives prescribed in the document entitled "Scope Of Work For Environmental Assessment at Sump Room Barnes Building Boston, Massachusetts" dated August 7, 1996.

This project falls under the direction of USACE-NED, 424 Trapelo Road, Waltham, Massachusetts, 02254-9149. The USACE-NED Engineering Manager (EM) is Mr. Byron Mah.

All work has been performed in an environmentally acceptable manner in accordance with the Massachusetts Contingency Plan (MCP), under the direction of a Licensed Site Professional and all applicable Federal, State, and Local laws and regulations.

2.2 Project Objectives

The objective of groundwater sampling conducted during this environmental assessment is to determine the level of contamination in ground water in the sump and air in the vicinity of the Sump Room; determine the location to which the sump is discharging; determine whether an immediate response action is required pursuant to Massachusetts Contingency Plan (MCP) Section 40.0411; provide recommendations of actions including permits necessary to bring the sump dewatering system into environmental compliance; and identify any permits or discharge/emissions requirements associated with the site and potential remediation activities.

The objective of the air sampling conducted during this environmental assessment is to determine if fuel-related contaminants present in groundwater at the sump and beneath the building are impacting air quality within the building.

2.3 SITE LOCATION, PHYSIOGRAPHY, OWNERSHIP AND PRIOR LAND USE

The Barnes Building, which is located at 495 Summer St. Boston, MA (see Figure 2-1), was constructed in 1909 for the Fargo Real Estate Trust. It was designed as a wool warehouse and originally called the Fargo Building. In the early 1940s, the building was acquired by the Navy, who made extensive renovations to the structure. Following acquisition of the building by the Army in 1975, rehabilitation of the building was performed to provide office space for the following Department of Defense agencies:

- Army Recruiting Battalion;
- U.S. Marine Corps Recruiting Station;
- Navy Consolidated Civilian Personnel Office;
- Defense Investigative Service;
- Defense Orthopedic Footwear Clinic;
- Office of Naval Research Detachment;
- Navy Passenger Transportation Office;
- Navy Publications and Printing Service Detachment Office;
- Boston Military Entrance Processing Station;
- U.S. Army Reserve Center
- Defense Contract Administration Services Region;
- Defense Criminal Investigative Services;
- Navy Investigation Service Resident Agency;
- Supervisor of Shipbuilding, Conversion and Repair, USN; and
- DCMDN Boston Health Unit (formerly DCASR Boston Health Unit).

These tenants relocated to the building in early 1980s, following completion of the renovations.

Based on information provided in the Spill Prevention, Control, and Countermeasure (SPCC) Plan for the Barnes Building, several of the tenants utilize hazardous materials in their operations.

These include:

- Supervisor of Shipbuilding Conversion and Repair, which uses petroleum distillates and inks in the reproduction and printing of blueprints;
- Navy Publications and Printing Service Detachment Office Shop, which uses
 photo and printing chemicals and inks in the production of documents and
 forms; and

 Defense Contract Administration Services Region which operates a heated solvent tank for parts cleaning and degreasing in their Nondestructive Testing Laboratory.

The SPCC Plan also indicates other potential sources of hazardous material which are located in the Barnes Building basement. These include:

- Hazardous Accumulation Area, where waste photo chemicals and printing inks are stored;
- Boiler Room, where No. 4 fuel oil is used in the furnaces and chemicals are used to treat boiler water;
- Battery Room, where lead/acid batteries are housed for auxiliary power supply;
- Janitorial Supply Room, where floor strippers and cleaning chemicals are stored; and
- Auxiliary Generator Tank Room, where a 250-gallon tank is used to store diesel fuel for an emergency generator.

Two underground oil tanks are located adjacent to the Barnes Building on Inman Street. A spill of 1,000 to 3,000 gallons of No. 6 heating oil reportedly occurred in 1974. The two 15,000-gallon steel tanks were reportedly replaced in 1985 with two 15,000-gallon fiberglass tanks for storing No. 4 fuel oil. Other potential sources of petroleum hydrocarbons include former gas stations located on the corner of D Street and Summer Street.

2.4 BACKGROUND

On several occasions during the spring and summer of 1982, the basement of the Barnes Building was flooded with up to one foot of water with a black liquid floating on top of it. The flooding events reportedly produced petroleum odors which permeated the entire building, causing employee complaints and sick leave. At the time, communications from the Fort Devens Director of Engineering and Housing to the New York District, Corps of Engineers suggested that the condition in the basement had existed for a number of years, when the building was known as the Fargo Building. A later memorandum prepared by the Corps of Engineers indicated that vapors and liquid had been documented in building data obtained from the Navy and noted in the basement during field investigations for the building renovations. According to this memorandum, earlier tests performed on the liquid indicated that it was greater than 95 percent No. 2 fuel oil.

In July 1982, analysis of a sample of the basement liquid by U.S. Army Natick Research and Development Laboratories indicated that it contained various alkyl aromatic compounds and hydrocarbons. The gas chromatograph of the liquid was compared to those of linseed oil and turpentine, but did not match either of the gas chromatograms.

In September 1982, the condition in the Barnes Building basement was reported to the National Spill Response Center, Washington, DC and the information passed on to the Coast Guard and EPA Region I. The condition was also reported to the Office of Incident Response, Department of Environmental Quality Engineering (now the DEP), Boston, MA. A sample of the basement liquid was analyzed by Environmental Testing and Certification and reportedly contained 31,400 milligrams per liter (mg/l) methylene chloride 1,630 mg/l anthracene; 1,170 mg/l pyrene; 1,000 mg/l fluoranthene; and 378 mg/l naphthalene. No phenols, PCBs or pesticides were detected in the sample. Metals were reportedly analyzed, but the original laboratory reports were not discovered in ENSR's file review.

In October 1982, sampling of the basement was performed by Ganteaume & McMullen, their subcontractor Carr Research Laboratory, and the New York District, Corps of Engineers. At the time of the sampling, very little standing water was noted in the basement and no odors were noted in the boiler room area. Aliphatic hydrocarbons were detected in the air samples at the approximately 0.5 parts per million (ppm) by volume. Methylene chloride, which was reported at 9.2 ppm in an air sample collected in front of the basement paint shop, was the only specific volatile organic compound detected during the air sampling. Four samples of water were collected from the basement. No priority pollutant semivolatile organic compounds were detected in any of the samples, but in one sample benzene was reported at 21 micrograms per liter (μ g/l) and PCBs were reported at 17 μ g/l. A second sample was reported to contain 363 μ g/l; gasoline.

In March 1983, a follow-up investigation of the Barnes Building basement was performed by Carr Research Laboratory, Inc., under subcontract to Ganteaume & McMullen, Inc., for the New York District, Corps of Engineers. During the investigation, which was performed during a wet weather period, oil was noted floating on the water in the sumps in the basement of the building. Samples of oil, water and air were collected and analyzed. The oil from the sumps was characterized as a No. 6 fuel oil containing a few parts per million benzene by petroleum product fingerprinting. The gas chromatogram of the oil from the sumps did not match the gas chromatogram of oil in the two fuel tanks underneath Inman Street or diesel fuel from the gas station across D Street. Reportedly, the fuel stored in the tanks was changed from #6 to #4;

the exact date of the change in fuel type is unknown. However, it is possible that at the time the sampling was performed, the tanks contained #4 fuel oil, while the oil in the sump consisted of #6 fuel oil from past spillage. It is also possible that the oil in the sump was weathered and for that reason did not match the tank contents. A water sample collected from the sump pit beneath Inman Street reportedly contained 4,537 μ g/l methylene chloride, 193 μ g/l naphthalene, 6.5 μ g/l benzene, and hydrocarbons at unreported concentrations. A water sample reportedly collected from a well (referred to by ENSR as EW-1) under the sidewalk along the northwest side of the building contained 4,453 μ g/l methylene chloride, 1,320 μ g/l acetone, 1,028 μ g/l naphthalene, 99 μ g/l benzene and hydrocarbons at unreported concentrations. A water sample collected from the sump in the substation room reportedly contain 691 μ g/l methylene chloride. In addition, up to 300 ppm aliphatic hydrocarbons, up to 50 ppm toluene, up to 25 ppm xylenes, and up to 20 ppm benzene were detected in the ambient air of the basement, based on the sampling performed.

In March 1986, ESA Environmental Consultants sampled water that had collected in the basement in the vicinity of the oil burners. They also collected air samples from the same location. The water was found to contain a petroleum-base hydrocarbon. The air samples contained hydrocarbons as total concentrations ranging from 1,300 to 3,800 milligrams per cubic meter.

In December 1986, an evaluation of indoor air quality at the Barnes Building was completed by the U.S. Army Environmental Hygiene Agency. The study included a health survey of employees in the building, measurements of carbon dioxide in the air through out the building and an evaluation of the existing ventilation systems. The study found no significant medical problems attributable to inadequate ventilation but recommended adjustments to the existing air handling units.

An updated draft memorandum from Mark Malkasian, Director of Engineering and Housing, requested that a right of entry and easement be acquired from private property adjacent to the Barnes Building, in order to install a ventilation system off the Barnes Building basement, in the Sump Room beneath Inman Street. This memorandum referred to an existing oil catch basin and oil/water separator and recommended a ventilation system to remove fumes produced by the system and accumulating in the Sump Room. The memorandum stated that "a perforated pipe has been installed under the basement floor across the width of the building to collect the leakage from under the north end of the building." It also identified gasoline as being the likely component of liquid that seeps into the basement at periods when heavy rainfall coincides with high tide. This conclusion was based on the observation that the relative concentrations of benzene, toluene and xylenes in the liquid matched the ratio

of these compounds in gasoline. A line under the floor discharging to the sump was noted in the Sump Room during Stone & Webster's site inspection. Stone & Webster was not, however, able to confirm the location of the leakage collection pipe described in the Malkasian memorandum.

In December 1992, ENSR observed a three-inch diameter pipe protruding through the basement floor, under the sidewalk along the northwest side of the building. It is believed that this pipe represents the riser pipe of monitoring well EW-1, which was previously sampled in 1983. This well is abandoned (filled in with grout) and can no longer be used for groundwater sampling.

As part of the Central Artery/Third Harbor Tunnel Project, Camp Dresser & McKee completed one soil boring (SB1-43) approximately 80 feet northwest of the north corner of the Barnes Building, at the intersection of D and Summer Street. No VOCs were detected in the soil from this boring. None of the priority pollutant metals analyzed were detected at concentrations significantly elevated above background levels. TPH and total PAH concentrations in the fill materials were no higher than 150 and 9.82 mg/kg, respectively. No TPH or PAHs were detected in the native materials at this location.

3.0 SITE INVESTIGATION

3.1 Introduction

The EA for this project consisted of the following activities:

Records Review and Evaluation. Stone & Webster personnel reviewed and evaluated existing records and data as provided by the Contracting Officer and obtained regulatory requirements for the air and water discharges identified as being present in the sump room.

<u>Visual Site Inspection</u>. Stone & Webster personnel conducted a walk-over visual inspection, accompanied by a Certified Industrial Hygienist, to gather information for preparing the work plans and the Environmental Assessment report.

<u>Environmental Compliance Review.</u> Stone & Webster personnel conducted an environmental compliance review for related investigation activities and all facility sump operations in order to identify the federal, state and local environmental compliance requirements.

Ground Water Sampling at the sump. Two ground water samples were collected, one from the oil side of the oil/water separator in the sump and one from the water (discharge) side of the sump. Field measurements of pH, conductivity, turbidity and temperature were also collected.

<u>Air Sampling.</u> Three air samples were collected from the basement of the building. One sample was collected in the sump room with the ventilation system on. Two samples were collected with the ventilation system off; one in the sump room and one immediately outside the sump room. All three samples were collected and analyzed for volatile organic compounds by EPA Method TO-14.

3.2 VISUAL SITE INSPECTION

On November 4, 1996 a visual site inspection of the Barnes Building Sump Room and its surroundings was conducted by Stone & Webster personnel including a Certified Industrial Hygienist. The purpose of the site inspection was to gather information for preparing the work plans and the Environmental Assessment report.

The Sump Room is located in the northwest corner of the basement in the Barnes Building (see Figure 2-2). The Sump Room is entered through a sliding door that is kept padlocked by facility personnel. The room is well lit and the room floor is

relatively clean. A petroleum odor is present in the building basement and is most notable in the Sump Room.

Air quality was screened using both a Photo-Ionization Device (PID) and a Carbon Monoxide (CO), Oxygen (O), Hydrogen Sulfide (H_2S) and Lower Explosive Limit (LEL) Detector. No elevated readings of CO or LEL were observed. Slightly elevated PID readings were observed in the Sump Room and basement but were below any action level (less than 5 ppm). The Site Inspection Report for the Visual Inspection is included as Attachment A.

Sampling locations for both air sampling and groundwater sump sampling were chosen during this inspection and are presented in Figure 2-2.

The discharge side of the sump is approximately 3.5 feet by 3 feet, and 5 feet deep, for a total volume of 53 cubic feet (approximately 400 gallons). The oil side of the sump is approximately 3.5 feet by 2 feet, and 5 feet deep, for a total volume of 30 cubic feet (approximately 225 gallons). There was no information on the pump flow rate on the name plate. The pump was on intermittently during the site inspection, but no frequency could be determined. No estimate of the water discharge rate can be made based on the available information.

There is no backup pump for the sump pump. It the sump pump ceases operation, the basement would likely be prone to flooding of a similar order of magnitude as occurred previously.

3.3 AIR SAMPLING PROGRAM

An air sampling program was conducted at the Barnes Building on December 12 and 13, 1996. The air sampling was conducted to determine the extent of volatile organic petroleum contamination in the air within the Barnes Building Sump Room and in the area immediately outside the sump room All air samples were collected and analyzed for Volatile Organic Compounds (VOC). Samples were collected using Summa canisters. Control valves were preset at the laboratory so that the flow rate through the valve would fill the canister over an eight hour period. The valves were opened in the morning and closed eight hours later. The air samples collected are as follows (refer to Figure 2-2 for sample locations):

Air sample 1 1AR1X was collected over an eight hour period in the Sump Room with the room exhaust ventilation turned off. This sample is believed to represent the worst case concentration of VOCs that would be present in the air without engineering controls in-place.

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Air sample 2 2AR1X was collected over an eight hour period in the Sump Room with the room exhaust ventilation on. This sample is believed to represent the worst case concentration of VOCs that would be present in the air with engineering controls in operation.

Air sample 3

3AR1X was collected over an eight hour period in the boiler room adjacent to the Sump Room with the room exhaust ventilation turned off. This sample is believed to represent the worst case concentration of VOCs that would be present in the general basement air due to leakage from the Sump Room when the engineering controls in the Sump Room are not in operation.

Volatile Organic Compounds (VOC)

All air samples were collected and analyzed for VOCs by method TO-14 (Ref. Compendium of Methods for the Determination of Toxic Organic Compounds in Ambient Air, USEPA, 600/4-84/041). The analysis also identified any tentatively identified compounds (TIC) which were greater than ten percent of the nearest internal standard area. The laboratory considered that the contaminant might be semivolatile in nature, and, therefore, allowed extra analysis run time to allow later-eluting peaks to show up in the chromatogram

The results of the air sampling program are presented in Table 4-1 and are discussed in Section 4.2 of this report.

A total of 3 air samples were submitted to the contract laboratory. No QA/QC samples were collected for air analyses.

3.4 GROUNDWATER SUMP SAMPLING PROGRAM

A water sampling program was conducted at the Barnes Building on December 12, 1996. Two ground water samples were collected from the groundwater sump in the basement of the Barnes Building. Refer to Figure 2-2 for sample locations.

The objective of this sump sampling was to determine the level of contamination in ground water in the sump and to use these data to perform the following:

• determine whether an immediate response action is required pursuant to Massachusetts Contingency Plan (MCP) Section 40.0411;

- provide recommendations of actions including permits necessary to bring the sump into environmental compliance; and
- identify any permits or discharge/emissions requirements associated with the site and potential remediation activities.

One groundwater sump sample was collected from the oil side of the oil/water separator of the sump at the 0-1' depth interval. Given the possibility of the presence of floating product, it is believed that this sample interval provides the worst case concentration of contamination entering the sump.

One groundwater sump sample and a duplicate sample were collected from the water (discharge) side of the oil/water separator of the sump at a depth interval greater than two feet below the surface. These samples, collected near the discharge pump intake, are believed to be representative of the worst case concentration of contamination being discharged from the sump during normal operation. The duplicate sample was collected from the discharge side of the pump because the verification of the quality of the liquids being discharged to the BWSC system was deemed to be of the greatest import. All groundwater samples were analyzed for the following parameters:

- PCB/PEST Polychlorinated Biphenyls and pesticides
- EPH Extractable Petroleum Hydrocarbons
- VOCs Volatile Organic Compounds
- VPH Volatile Petroleum Hydrocarbons
- O&G Oil and Grease
- TPH Total Petroleum Hydrocarbons
- Total PP13 Metals Total Priority Pollutant 13 Metals

Analytical methods and QA/QC samples collected for the sump water are as follows:

Volatile Organic Compounds (VOC)

Sump water was analyzed for Volatile Organic Compounds (VOCs). VOC analysis of sump water samples was by SW846 method 8260A with a library search conducted on the ten largest non-target analytes which are greater than ten percent of the nearest internal standard area. Sample results included the associated Total Ion Chromatogram for the sample dilution reported.

A total of 5 sump water samples (2 standard and 3 QC) were submitted to the contract laboratory. One sample was submitted to the USACE-NED QA laboratory for VOC

analysis. A trip blank was collected and sent with the sump water samples to the contract laboratory for VOC analysis.

Extractable Petroleum Hydrocarbons (EPH)

Sump water was analyzed for Extractable Petroleum Hydrocarbons (EPH). EPH analysis by Gas Chromatography (GC) Fingerprint technique was performed as specified in "Method for the Determination of Extractable Hydrocarbons (EPH), Massachusetts Department of Environmental Protection "dated August 1995.

A total of 5 sump water samples (2 standard and 3 QC) were submitted to the contract laboratory. One sample was submitted to the USACE-NED QA laboratory for EPH analysis.

Volatile Petroleum Hydrocarbons (VPH)

Sump water was analyzed for Volatile Petroleum Hydrocarbons (VPH). VPH analysis by Gas Chromatography (GC) Fingerprint technique was performed as specified in "Method for the Determination of Volatile Petroleum Hydrocarbons (VPH), Massachusetts Department of Environmental Protection "dated August 1995.

A total of 5 sump water samples (2 standard and 3 QC) was submitted to the contract laboratory. One sample was submitted to the USACE-NED QA laboratory for VPH analysis. There was one trip blank collected and sent with the sump water samples to the contract laboratory for VPH analysis.

Pesticides/PCBs

The sump water was analyzed for Pesticides and Polychlorinated Biphenyls (PCBs). Sump water samples were prepared and analyzed using USEPA Method SW846 method 3550A/8081.

A total of 5 sump water samples (2 standard and 3 QC) were submitted to the contract laboratory. One sump water sample was submitted to the USACE-NED QA laboratory for Pesticide/PCB analysis.

Oil and Grease (O&G)

The sump water was analyzed for total oil and grease (O&G). Sump water samples were prepared and analyzed using USEPA Method 413.1 (gravimetric).

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A total of 5 sump water samples (2 standard and 3 QC) were submitted to the contract laboratory. One sump water sample was submitted to the USACE-NED QA laboratory for Oil and Grease analysis.

Total Petroleum Hydrocarbons (TPH)

The sump water was analyzed for Total Petroleum Hydrocarbons (TPH). Sump water samples were prepared and analyzed using USEPA Method 418.1.

A total of 5 sump water samples (2 standard and 3 QC) were submitted to the contract laboratory. One sump water sample was submitted to the USACE-NED QA laboratory for TPH analysis.

Total Priority Pollutant 13 Metals

The sump water was analyzed for Total Priority Pollutant 13 Metals (PP 13 Metals). Sump water samples were prepared and analyzed using USEPA Method SW846 method 7470 for mercury and 6010A for other metals.

A total of 5 sump water samples (2 standard and 3 QC) were submitted to the contract laboratory. One sump water sample was submitted to the USACE-NED QA laboratory for PP 13 Metals analysis.

Field measurements of pH, conductivity, turbidity and temperature measurements were also collected from the sump.

A thin (approximately 1/8 inch thick) layer of floating, separate phase liquid was observed in the bailer filled from the oil side of the oil/water separator. In addition, a layer (approximately 4 inches thick)of black, oily sludge was present in the bailer that had been allowed to sink to the bottom of the oil/water separator. Both the floating layer and sludge layer appeared to be weathered (this supposition is supported by the absence of VOCs as vapors or in solution). The sludge was bled off from the bailer into a glass jar before collecting water samples.

The results of the groundwater sump sampling program are presented in Tables 4-2 through 4-8 and are discussed in Section 4.3 of this report.

3.5 INVESTIGATION-DERIVED WASTE MANAGEMENT

No decontamination fluids or investigation derived waste were generated during these sampling activities. Groundwater samples from the oil side of the oil/water separator were collected with a disposable bailer. Groundwater samples from the water (discharge) side of the groundwater sump were collected with a peristaltic pump equipped with clean tygon tubing. The empty disposable bailer and tygon tubing contained de-minimus amounts of contaminants and were disposed of as general refuse. along with sampling gloves and tyvek coveralls.

4.0 LABORATORY ANALYTICAL RESULTS

4.1 Introduction

Air samples collected during the December 1996 field effort were analyzed by the Lancaster Laboratory (Lancaster), located in Lancaster, PA. The samples were analyzed in accordance with the approved SAP. The Lancaster laboratory data sheets are presented in Appendix B.

Groundwater sump samples collected during the December 1996 field effort were analyzed by the Mitkem Corporation (Mitkem), located in Warwick, Rhode Island.

The Mitkem laboratory data sheets, including the laboratory ion chromatograms, the results of the laboratory data validation, and narrative for procedures followed for sample analyses are presented in Appendix C.

Data validation of air and water results was provided by Kestrel Environmental Services. The results of the laboratory data validation are summarized in Section 4.4 and presented in full in Appendix D.

4.2 COMPARISON OF AIR SAMPLING RESULTS TO SCREENING LEVELS

The results for the Sump Room and basement air quality samples were compared to the federal Occupational Safety and Health Administration (OSHA) and National Industrial NIOSH Time-Weighted Average (TWA) standards. Industrial exposure standards were deemed to be appropriate given the business use of the building, the absence of children in the building on a regular basis, and the restricted access to the building and the area of interest (all entrances are continuously guarded and entry permits are required).

Table 4-1 summarizes air sampling results and presents applicable OSHA and NIOSH TWAs. As can be seem by a review of these data, all detected compounds for which standards exist are present at concentrations at least three orders of magnitude below the 8-hour time weighted average (TWA) concentrations for industrial settings published by NIOSH and/or OSHA.

4.3 COMPARISON OF GROUNDWATER SUMP RESULTS TO SCREENING LEVELS

Tables 4-2 through 4-8 present the results of the sump water sampling. Analytical data was compared to both BWSC and MWRA influent standards. Where standards exist, the more stringent standard has been presented for the purpose of comparison and evaluation. For the compounds analyzed, only the BWSC or MWRA influent standard

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for napthalene is exceeded. The napthalene concentration is at the detection limit and is well below Massachusetts Drinking Water Standards, however.

Groundwater sump analyses were also compared to applicable MCP Method 1, GW-2 and GW-3 groundwater standards. GW-2 standards were deemed applicable since groundwater is less than 15 feet below the basement of the Barnes Building. GW-3 standards are applicable since all groundwater in the Commonwealth of Massachusetts falls under this designation. MCP limits do not specifically apply to the water collected in the sump of the Barnes Building. The MCP limits do apply to the groundwater in the area of the Barnes Building. It is assumed that the water in the sump is indicative of the groundwater below the Barnes Building.

The concentration of TPH detected in the oil-side of the sump oil/water separator (250 ppm) exceeds the current GW-3 standard of 50 ppm, the proposed GW-3 standard of 6 ppm and the proposed GW-2 standard of 2 ppm (see Table 4-2).

No current MCP standards are exceeded on the water (discharge) side of the sump. The sump discharge (7 ppm) would exceed the proposed GW-3 and GW-2 TPH standards of 6 ppm and 2 ppm, respectively. The sump discharge also exceeds the proposed GW-2 EPH standards for C9-C18 aliphatics (sump discharge level is 2.1 ppm, C9-C18 aliphatic GW-2 limit is 1 ppm). The discharge side does not exceed any other proposed MCP limits. Should the proposed standards become regulation, the sump operation should not be effected given that the discharge is into the closed BWSC system. The adoption of the new GW-2 standards will, however require action regarding the characterization and possible remediation of groundwater beneath the Barnes Building.

4.4 DATA VALIDATION RESULTS

Data validation, was performed by Kestrel Environmental Technologies, Inc., and augmented by Stone & Webster. Stone & Webster reviewed additional laboratory data which was received after the original packages had been sent to Kestrel. The data (see Appendix D) was evaluated based on the following parameters in accordance with standard USEPA data validation guidelines:

- chain of custody documents
- sample log-in documents
- trip blanks, field blanks, and method blanks
- Matrix Spike/Matrix Spike Duplicates results
- Laboratory Control Samples/Laboratory Control Sample Duplicate results

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- field duplicate results
- surrogate recoveries
- holding times
- data completeness

Chain of Custody Documents

All criteria were met for the Chain of Custody Documents.

Sample Log-in Documents

Laboratory cooler receipt documentation was generally in order. Mitkem did not record the actual sample pHs upon sample receipt. Also, Lancaster Laboratories did not note the pressure of each canister on the log-in documents, although they were noted on each sample results page.

Trip Blanks, Field Blanks, and Method Blanks

VOCs, TPH, Organochlorine Pesticides, Oil and Grease and EPH/VPH were not detected in the associated method blank. Aromatics were found in the VPH Trip blank. Copper and Antimony were detected in one of the Preparation Blanks. As a result, the C9- C10 aromatics were flagged with a "J" in samples 1SW1X, 1SW2X and 1SW2D, copper was flagged with a "U" for samples 1SW1X and 1SW2D, and antimony was flagged with a "U" for sample 1SW2D. No equipment blanks were reported Oil & Grease, TPH or inorganics.

Matrix Spike/Matrix Spike Duplicates Results

For VOCs, VPH and TPH, all percent recoveries (%R) and RPD between the %Rs were acceptable. In the EPH, inorganic and organochlorine pesticides analyses, recoveries were detected outside the %R range. As a result, endosulfan sulfate results for 1SW1X and C19-C36 aliphatics for 1SW2X were qualified "J". The MS/MSD was not done for O&G due to a laboratory error.

<u>Laboratory Control Samples/Laboratory Control Sample Duplicate Results</u>

All criteria for these parameters were met for EPH, VPH and inorganics. For Oil & Grease, no LCS/LCSD results were reported. For volatiles, LCS recoveries for several

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compounds fell outside the nominal 80-120% limits. Results were qualified as "UJ" or "J" based on this finding. Refer to Appendix D for details.

Field Duplicates Results

Precision criteria were met for EPH, TPH and Organochlorine Pesticides. The metals lab duplicate results were all ND and therefore met duplicate precision criteria of ±CRDL. The O&G duplicate results were both over the QC limits but no qualifying action was taken. For VPH, the aromatic results were exceeded; the sample would have been flagged but it was already qualified due to Trip blank contamination.

Surrogate Recoveries

All system monitoring compound recoveries were within contract required QC limits. For EPH, surrogate recoveries could not be determined in 1SW1X due to co-eluting interferences. Therefore all positive hits were qualified "J" and all non-detects were qualified "UJ" in EPH sample 1SW1X.

Holding Times

For the pesticides/PCB analysis, holding times were exceeded by one day. Due to this exceedance, sample positive detects (delta-BHC and endosulfan sulfate in sample 1SW1X) were flagged "J", and for all samples all compounds present at less than method detection levels were flagged "UJ".

Data Completeness

Several items were missing from the results. These include results for thallium and selenium, VOC BFB (GC/MS tune). These results were received at a later date. The MS/MSD for oil & grease was also missing due to laboratory error. The VOC BFB (GC/MS tune) results were also missing. Only a fraction of analytes were spiked in the LCS run.

Other

Aqueous EPH samples were not preserved with HCl, as required by the EPH method. This was noted in the Field Sampling Data Sheets (Appendix E). Consequently, EPH results reported may be slightly lower than actual concentrations, due to bacterial degradation. This effect is thought to be slight, since samples were collected on 12/13/96 and extracted on 12/17/96, a period of only four days, and also the effect of

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ENVIRONMENTAL ASSESSMENT BARNES BUILDING bacterial degradation on SVOCs and EPH is not great. EPA method 8270, for SVOCs,

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does not require preservation with HCl.

5. REGULATORY COMPLIANCE REVIEW

A file review of the BWSC files was conducted to determine the fate of water pumped from the groundwater sump in the basement of the Barnes Building. It was determined from the BWSC files, which date back to the construction of the Barnes (then Fargo) Building, that the groundwater sump discharges into a combined BWSC sanitary sewer line under Inman Street, located behind the Barnes Building. According to BWSC construction plans, no separate storm sewer line is present under Inman St. The BWSC combined sewer line feeds into a series of larger sewers which eventually empty into the MWRA South Boston Interceptor Line which flows to the Deer Island Treatment complex.

A copy of "REGULATIONS GOVERNING THE USE OF SANITARY AND COMBINED SEWERS AND STORM DRAINS OF THE BOSTON WATER AND SEWER COMMISSION" was obtained and reviewed to determine compliance requirements for the operation of the groundwater sump. The following BWSC definitions are provided for the sake of clarity during the compliance discussion:

Dewatering drainage shall mean the groundwater or surface water which is removed from a site and discharged beyond the limits of the site by means of gravity or pumping.

Combined Sewer shall mean a sewer designed to receive both wastewater and storm or surface water.

Sewer shall mean a pipe or conduit that carries either wastewater or storm or surface water.

Sanitary Sewer shall mean a sewer designed to carry sanitary sewage and industrial wastes.

Storm drain shall mean a pipe or conduit designed to carry groundwater, stormwater, or runoff.

Article III (Building Sewers, Building Storm Drains and Connections) Section 7 (Wastewater-Stormwater Separation) reads as follows (bold faced type and italics are added by Stone & Webster for emphasis):

"The plumbing of any existing or new building shall be so constructed as to keep all stormwater, surface water, groundwater, uncontaminated cooling water, and uncontaminated industrial process water separate from the

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building sewer. Where separate storm drain and sanitary sewers are provided, building storm drains shall be connected to a storm drain and building sewers shall be connected to a sanitary sewer.....Where only a combined sewer has been provided, the separate building storm drain and building sewers shall be connected to the building sewer in a manner prescribed by the Commission's Requirements for Site Plans and the building sewer connection shall be made to such combined sewer. No wastewater shall be discharged into a storm drain."

Since only a combined sewer is provided by BWSC in the vicinity of the Barnes Building, the tie-in of the groundwater sump to the combined sewer behind the Barnes Building is appropriate.

Article II (Use of Sewers) Section 3 (Applicable Regulations) reads as follows:

"Any user of the Commission's wastewater or storm drainage systems shall be subject to Commission and MWRA regulations and to any charges, rates, fees, and assessments which are or may be established by the Commission or the MWRA. Any user of the Commission's wastewater or storm drainage system shall also be subject to applicable Federal and State regulations. In instances where various regulations contain different requirements, the most stringent requirements should be met."

As stated in Section 4.3 of this EAR, no current MCP, BWSC, or MWRA standard, with the exception of napthalene, was exceeded by the sump effluent water.

6.0 CONCLUSIONS AND RECOMMENDATIONS

6.1 CONCLUSIONS

The following conclusions can be drawn from the evaluation of the above listed data and the review of applicable permit and regulatory standards:

All detected volatile compounds for which OSHA and/or NIOSH standards exist are present at concentrations at least three orders of magnitude the 8-hour time weighted average (TWA) concentrations for industrial settings published by NIOSH and/or OSHA.

The groundwater sump discharges to a combined sewer in Inman St. The discharge of a stormwater (groundwater falls under this BWSC defined term) sump is permitted by BWSC regulations given the absence of a storm sewer to tie the discharge into. Since no storm sewer is present under Inman St., this discharge should be allowed by BWSC. The sump is not, however a metered flow.

The groundwater sump discharge meets both MWRA and BWSC influent standards for all compounds analyzed, except for napthalene, which was detected at the reporting limit on the water side of the oil-water separator. The napthalene, present at a concentration of 0.005 ppm on the discharge side of the sump, is below the Massachusetts Drinking Water Standard of 0.020 ppm, and therefore should be acceptable for discharge to the BWSC sewers.

The oil-side of the groundwater sump contains both a thin (approximately 1/8 inch thick) layer of floating, separate phase liquid and a layer (approximately 4 inches thick) of black, oily sludge at the oil/water separator.

The concentration of Total Petroleum Hydrocarbons on the oil-side of the sump oil/water separator (250 ppm) exceeds the GW-3 standard of 50 ppm.

No current MCP standards are exceeded on the water (discharge) side of the sump. The sump discharge (7 ppm) would exceed the proposed GW-3 and GW-2 TPH standards of 6 ppm and 2 ppm, respectively. The sump discharge also exceeds the proposed GW-2 EPH standards for C9-C18 aliphatics (sump discharge level is 2.1 ppm, C9-C18 aliphatic GW-2 limit is 1 ppm). The discharge side does not exceed any other proposed MCP limits. Should the proposed standards become regulation, the sump operation should not be effected given that the discharge is into the closed BWSC system. The adoption of the new GW-2 standards will, however require action

regarding the characterization and possible remediation of groundwater beneath the Barnes Building

6.2 RECOMMENDATIONS

The Barnes Building Sump is currently not in compliance with BWSC regulations. Recommendations for the Barnes Building Sump Room are as follows:

The BWSC should be made aware of this discharge and consulted as how this sump can be brought into compliance with their requirements.

Determine the discharge rate and frequency of operation of the sump in support of the BWSC permit application. This can be accomplished by performing field measurements of sump water level, and determining the discharge volume.

Pump out the oil side of the oil/water separator in the building sump to remove the floating separate phase liquid and oily sludge present. This material should be disposed of in compliance with federal, state and local regulations by a licensed waste hauler.

Continue the use of the lock on the sump room door to restrict unauthorized access to the sump room. Consider posting a sign prohibiting the discharge of any liquids into the sump.

Continue the operation of the building ventilation system to reduce the amount of nuisance odors present in the sump room.

GLOSSARY OF ABBREVIATIONS AND ACRONYMS

BFB Bromofluorobenzene

BWSC Boston Water and Sewer Commission

CO Carbon Monoxide

CRDL Contract Required Detection Limit

DEP Department of Environmental Protection

DOD Department of Defense

DQCR Daily Quality Control Report

EA Environmental Assessment

EAR Environmental Assessment Report

EM Engineering Manager

EPH Extractable Petroleum Hydrocarbons

GC Gas Chromatography

GC/MS Gas Chromatograph/Mass Spectrophotometer

HCl Hydrochloric Acid H₂S Hydrogen Sulfide

IDW Investigation Derived Waste

LEL Lower Explosive Limit
LSP Licensed Site Professional

MADEP Massachusetts Department of Environmental Protection

MCP Massachusetts Contingency Plan mg/kg milligram per kilogram (ppm) mg/L milligram per liter (ppm)

MWRA Massachusetts Water Resources Authority

MS Matrix Spike

MSD Matrix Spike Duplicate

ND Non-detect

NIOSH National Institute for Occupational Safety and Health

O Oxygen

O&G Oil and Grease

OSHA Occupational Safety and Health Administration

PCB Poly- Chlorinated Biphenyls

Pest Pesticides

PID Photoionization Detector
PP 13 Priority Pollutant 13 Metals
PPE Personal Protective Equipment
ppb(v) parts per billion by volume

ppm parts per million

QAPP Quality Assurance Project Plan
QA/QC Quality Assurance/Quality Control

RPD Relative Percent Difference

%R Percent Recovery

SAP Sampling and Analysis Plan

SOW Scope of Work

SPCC Spill Prevention Countermeasure Control

SSHP Site Safety and Health Plan

TIC Tentatively Identified Compound
TPH Total Petroleum Hydrocarbon
TWA Time-Weighted Average

 $\mu g/L$ Micrograms per liter (ppb)

USACE-NED U.S. Army Corps of Engineers - New England Division

USEPA U.S. Environmental Protection Agency

VOC Volatile Organic Compound VPH Volatile Petroleum Hydrocarbons

REFERENCES

Chemical Data Quality Management For Hazardous Waste Remedial Measures, U.S. Army Engineering Regulation, ER-1110-1-263, 1 April 1996.

U.S. Army Corps of Engineers Safety and Health Requirements Manual, U.S. Army Engineering Manual, EM-385-1-1, 1992.

Test Methods for Evaluating Solid Wastes, USEPA SW-846, Third Edition, September, 1986; Update I, July 1992; Update II, September 1994; Update IIA, August 1993; Update IIB, January 1995.

Requirements for the Preparation of Sampling and Analysis Plans, EM 200-1-3, 1 September 1994.

Interim Final Petroleum Report: Development of Health-Based Alternative to the Total Petroleum Hydrocarbon (TPH) Parameter prepared by the Massachusetts Department of Environmental Protection (MA DEP).

Method for the Determination of Extractable Petroleum Hydrocarbons (EPH), Massachusetts Department of Environmental Protection, dated August 1995.

Method for the Determination of Volatile Petroleum Hydrocarbons (VPH), Massachusetts Department of Environmental Protection, dated August 1995.

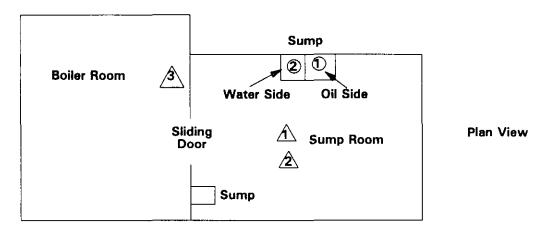
Validation of Analytical Chemistry Laboratories, EM 200-1-1, dated 1 July 1994.

Regulations Governing The Use Of Sanitary And Combined Sewers And Storm Drains Of The Boston Water And Sewer Commission, Revised 15 August, 1989

360 CMR 10 - Massachusetts Water Resources Authority, Effective 16 September, 1988

310 CMR 40.0000 - The Massachusetts Contingency Plan, April, 1996

Barnes Building Basement



Not To Scale

- (1) Sump Water Oil Side Sample, 0-1' 1SW1X
- Sump Water Water Side Sample, <2' 1SW2X; 1SW2M; 1SW2D</p>
- A Air Sample; Sump Room, Ventilation Off 1AR1X
- À Air Sample, Sump Room, Ventilation On 2AR1X
- Air Sample, Boiler Room, Ventilation Off 3AR1X

Figure 2-2 Sump Room Sampling Area Locations

TABLE 4-1

Barnes Building Air Sampling Results POSITIVE OCCURRENCES OF IDENTIFIED VOLATILE ORGANIC COMPOUNDS

Sample	1AR1X	2AR1X	3AR1X	NIOSH/OS	SHA TWA			
Compound	Concentration (ppb(v))							
Dichlorodifluoromethane	1	6	6	1000000	NIOSH/OSHA			
Chloromethane	ND	ND	1	NL				
Trichlorofluoromethane	5	2	3	NL				
1,2-Dichloroethane	19	15	4	NL				
Toluene	4	5	14	100000	NIOSH			
Tetrachloroethene	1	1	ND	NL				
m/p-Xylene	ND	1	2	100000	NIOSH/OSHA			
1,2,4-Trimethylbenzene	ND	1	2	25000	NIOSH			
Tentatively Identified Compounds	•							
Propane	92	68	ND	1000000	NIOSH/OSHA			
Isobutane	36	34	26	800000	NIOSH			
Butane	31	28	16	800000	NIOSH			
Acetaldehyde	ND	ND	4	200000	OSHA			
2-methyl-Butane	5	12	37	NL	· · · · · · · · · · · · · · · · · · ·			
Pentane	3	3	3	120000	NIOSH			
Ethanol	ND	ND	3	1000000	NIOSH/OSHA			
Acetone	3	3	8	250000	NIOSH			
2-methyl-Pentane	4	3	3	NL				
N,N-dimethyl-Acetamide	ND	5	ND	10000	NIOSH/OSHA			
Hexane	2	ND	ND	50000	NIOSH			

Samples Ventilation Configuration at Time of Sample

1AR1X Sump Room Ventilation Off 2AR1X Sump Room Ventilation On 3AR1X Boiler Room Ventilation Off

ND = Not Detected NL = Not Listed

ppb(v) = parts per billion by volume TWA = Time Weighted Average

Table 4-2

Barnes Building Basement Sump Water Analytical Results OIL AND GREASE and TOTAL PETROLEUM HYDROCARBONS

Sample:	1SW 1X	1SW 2X	1SW 2XD	MWRA Discharge Limit (a)	MCP GW3 Limit (b)	Proposed MCP GW-2 Limit (c)	Proposed MCP GW-3 Limit (c)	
Compound	CONCENTRATION = mg/L							
Oil & Grease	90 J	4 J	6 J	15	NL	NL	NL	
TPH	250	200 6 (2)	3.) 4 7 . (%)	15	50	2	6	

- (a) = Limit specified in 360 CMR 10.023
- (b) = Current Massachusetts Contingency Plan (MCP), 310 CMR 40.0000 Limit. No GW2 standard currently exists.
- (c) = Proposed Revisions to the Massachusetts Contingency Plan, 310 CMR40.0000, Public Hearing Draft 1/17/97

NL = Not Listed

J = Estimated Result

<u>Sample</u>	Sample Location
1SW 1X =	Basement sump - oil side of oil/water separator
1SW 2X =	Basement sump - water side of oil/water separator (sump pump discharge)
1SW 2XD =	Duplicate sample of 1SW 2X

TABLE 4-3

Barnes Building Basement Sump Water Analytical Results PCB/PESTICIDES

Sample:	1SW 1X	1SW 2X	1SW 2XD	MCP GW-2 Limit (b) (d)	MCP GW-3 Limit (b)	BWSC Discharge Limit (a)
Compound		CONCENT	RATION =		,	
4,4'-DDD	ND	ND	ND	NL	0.006	0
4,4'-DDE	ND	ND	ND	NL	0.02	0
4,4'-DDT	ND	ND	ND	NL	0.0003	0
Aldrin	ND	ND	ND	0.0005	0.009 (c)	0
alpha-BHC	ND	ND	ND	NL	NL	0
alpha-Chlordane	ND	ND	ND	NL	NL	0
beta-BHC	ND	ND	ND	NL	NL	0
Chlordane	ND	ND	ND	NL	0.002	0
delta-BHC	0.11P	ND	ND	NL	NL	0
Dieldrin	ND	ND	ND	NL	0.0001	0
Endosulfan I	ND	ND	ND	NL	0.0001	0
Endosulfan II	ND	ND	ND	NL	0.0001	0
Endosulfan Sulfate	0.13P	ND	ND	NL	NL	0
Endrin	ND	ND	ND	NL	0.005	0
Endrin Ketone	ND	ND	ND	NL	NL.	0
Endrin Aldehyde	ND	ND	ND	NL	NL	0
gamma-BHC (Lindane)	ND	ND	ND	NL	NL	0
gamma-Chlordane	ND	NĎ	ND	NL	NL	0
Heptachlor	ND	ND	ND	NL	0.001	0
Heptachlor Epoxide	ND	NĎ	ND	NL	0.002	0
Toxaphene	ND	ND	ND	NL	NL	0
PCB-1016	ND	ND	ND	NL	0.0003	0
PCB-1221	ND	ND	ND	NL	0.0003	0
PCB-1232	ND	ND	ND	NL	0.0003	0
PCB-1242 (1016)	ND	ND	ND	NL	0.0003	0
PCB-1248	ND	ND	ND	NL	0.0003	0
PCB-1254	ND	ND	ND	NL	0.0003	0
PCB-1260	ДИ	ND	ND	NL	0.0003	0
				<u> </u>		

- (a) = Limit specified in REGULATIONS GOVERNING THE USE OF SANITARY AND COMBINED SEWERS AND STORM DRAINS OF THE BOSTON WATER AND SEWER COMMISSION
- (b) = Current Massachusetts Contingency Plan (MCP), 310 CMR 40.0000 Limit. Table 1
- (c) = Proposed Revisions to the Massachusetts Contingency Plan, 310 CMR40 0000, Public Hearing Draft 1/17/97
- (d) = There are no proposed revisions to the MCP GW-2 standards.

ND = NOT DETECTED

NL = NOT LISTED

P = Flag is used for Pesticide analytes when there is a greater than 50% difference for detected concentration between the GC columns used for Primary and Confirmation Analyses. The lower of the two values is reported

<u>Sample</u>	Sample Location
1SW 1X =	Basement sump - oil side of oil/water separator
1SW 2X =	Basement sump - water side of oil/water separator (sump pump discharge)
1SW 2XD =	Duplicate sample of 1SW 2X

TABLE 4-4

Barnes Building Basement Sump Water Analytical Results TOTAL METALS

	Sample:	1SW 1X	1SW 2X	1SW 2XD	MCP GW-2 Limit (b) (c)	MCP GW-3 Limit (b) (c)	BWSC Discharge Limit (a)
Compound			CONCEN	TRATION =			
Antimony		ND	ND	ND	NL	0.13	10.0
Arsenic		ND	ND	ND	NL	0.4	0.5
Beryllium		ND	ND	ND	NL	0.05	NL
Cadmium	_	ND	ND	ND	NL	0.01	0.1
Chromium	•	ND	ND	ND	NL	2	0.1
Copper		ND	ND	ND	NL	NL	1.5
Lead		0.01	ND	ND	NL	0.03	0.4
Mercury		ND	ND	ND	NL	0.001	0.0
Nickel		ND	ND	ND	NL	0.08	1.0
Selenium		ND	ND	ND	NL	0.08	5.0
Silver		ND	ND	ND	NL	0.007	2.0
Thallium		ND	ND	ND	NL	0.4	NL
Zinc	•	0.16	ND	ND	NL	0.9	1.0

- (a) = Limit specified in REGULATIONS GOVERNING THE USE OF SANITARY AND COMBINED SEWERS AND STORM DRAINS OF THE BOSTON WATER AND SEWER COMMISSION
- (b) = Current Massachusetts Contingency Plan (MCP), 310 CMR 40.0000 Limit. Table 1.
- (c) = There are no proposed revisions to the MCP standards.

ND = NOT DETECTED NL = NOT LISTED

Sample	Sample Location
1SW 1X =	Basement sump - oil side of oil/water separator
1SW 2X =	Basement sump - water side of oil/water separator (sump pump discharge)
1SW 2XD =	Duplicate sample of 1SW 2X

TABLE 4-5

Barnes Building Basement Sump Water Analytical Results Extractable Petroleum Hydrocarbons (EPH)

				BWSC	Proposed	Proposed
Sample:	1SW1X	1SW2X	1SW2XD	Discharge	MADEP GW-2	MADEP GW-3
				Limit (a)	Limits (c) (d)	Limits (c) (d)
Compound		CONCEN	RATION = 1	ng/L		
SDU.						
EPH CO C19 Alimbodica	in interned	of et militane e	2.10	B.11		
C9-C18 Aliphatics				NL NL	1	20
C19-C36 Aliphatics	20.00 J	0.35 J	0.36 J	NL_	NL 50	50
C11-C22 Aromatics	26.00	0.92	1.00	NL	50	3
TOTAL EPH(b)	31.00	1.00	1.20	NL	NL	NL
EPH - Target Analytes						
Acenaphthane	NĐ	ND	ND	NL	NL	5
Acenaphthylene	ND	ND	ND	NL NL	NL NL	3
Anthracene	ND	ND ND	ND ND	NL	NL NL	3
Benzo(a)Anthracene	ND	ND	ND	NL NL	NL NL	3
Benzo(a)Pyrene	ND	ND _	ND	NL NL	NL NL	3
Benzo(a) Fluoranthene	ND	ND	ND	NL NL	NL NL	
Benzo(g,h,i)Perylene	ND ND	ND ND	ND ND	NL NL	NL NL	3
	ND	ND ND	ND I	NL NL		3
Benzo(k)Fluoranthene	ND ND	ND ND	ND ND		NL NL	
Chrysene	ND ND		ND ND	NL NII	NL NL	3
Dibenzo(a,h)Anthracene		ND ND		NL 1.5	NL NL	
Fluoranthene	ND	ND	ND	1.5	NL NL	0.2
Fluorene	ND	ND	ND	NL	NL NL	3
Indeno(1,2,3-c,d)Pyrene	ND	ND	ND	NL	NL	3
Naphthalene	ND	ND_	ND	NLNL	NL NL	6
Phenanthrene	ND	ND	ND ND	NLNL	NL NL	0.05
Pyrene	ND	ND	ND	NL_	NL	3
2-Methylnaphthalene	ND	ND	ND	NL	20	3
			<u> </u>			

- (a) # Limit specified in REGULATIONS GOVERNING THE USE OF SANITARY AND COMBINED SEWERS AND STORM DRAINS OF THE BOSTON WATER AND SEWER COMMISSION
- (b) = Calculation for computing total EPH is as follows: Total EPH = (0.5)(C9-C18 aliphatics)+ (0.005)(C19-C36 Aliphatics) + (1.0)(C10-C22 Aromatics)
- (c) = Revisions to the Massachusetts Contingency Plan, 310 CMR40.0000, Public Hearing Draft 1/17/97 Cleanup Standards
- (d) = There are no current MCP standards for EPH

ND = NOT DETECTED NL = NOT LISTED

J = Estimated Result

1SW 1X = Basement sump - oil side of oil/water separator
1SW 2X = Basement sump - water side of oil/water separator (sump pump discharge)

1SW 2XD = Duplicate sample of 1SW 2X

TABLE 4-6

Barnes Building Basement Sump Water Analytical Results Volatile Petroleum Hydrocarbons (VPH)

Sample:	1SW 1X	1SW 2X	1SW 2XD	BWSC Discharge Limit (a)	MCP GW-2 Limits (c)	MCP GW-3 Limits (c)
Compound		CONCENT	RATION = m			
VPH						
C5-C8 Aliphatics	ND	ND	ND	NL	1	40
C9-C12 Aliphatics	0.28	0.19	0.16	NL	1	20
C9-C10 Aromatics(b)	ND	ND	ND	NL	5	4
TOTAL VPH(b)	ND	ND	ND	NL	NL (d)	NL (d)
VPH - Target Analytes						
MTBE	ND	ND	ND	NL	50	50
Benzene	ND	ND	ND	0	2	7
Toluene	ND	0.015	0.016	NL	6	50 -
Ethlybenzene	ND	ND	ND	NL	30	4
m- and p- Xylenes	ND	ND	ND	NL	6	50
o- Xylene	ND	ND	ND	NL	6	50
Napthalene	0.006(e)	0.005 (e)	0.005 (e)	0 (e)	6	6

- (a) = Limit specified in REGULATIONS GOVERNING THE USE OF SANITARY AND COMBINED SEWERS AND STORM DRAINS OF THE BOSTON WATER AND SEWER COMMISSION
- (b) = Due to trip blank contamination, reporting limit for C9-C10 aromatics and Total VPH was raised to 0.175 mg/L. Both the C9-C10 aromatics and Total VPH are non-detects at this level. Refer to Appendix D.
- (c) = Revisions to the Massachusetts Contingency Plan, 310 CMR40.0000, Public Hearing Draft 1/17/97 Cleanup Standards
- (d) = There are no current MCP standards for VPH
- (e) = Massachusetts Drinking Water Standard for Napthalene is 0.020 ppm

ND = NOT DETECTED NL = NOT LISTED

<u>Sample</u>	Sample Location
4-0141434	- ·

1SW 1X = Basement sump - oil side of oil/water separator

1SW 2X = Basement sump - water side of oil/water separator (sump pump discharge)

1SW 2XD = Duplicate sample of 1SW 2X

Table 4-7

Barnes Building Basement Sump Water Analytical Results VOLATILE ORGANICS

Sample:	1SW 1X	1SW 2X	1SW 2XD	MCP GW-2	MCP GW-3	BWSC Discharge
·				Limits (c)	Limits (c)	Limt (a)
Compound		CONCENT	RATION =	mg/L		
1,1-Dichloroethane	ND	ND	ND	9	50	NL
1,1-Dichloroethene	ND	ND	ND	NL	NL	NL
1,1-Dichloropropene	ND	ND	ND	NL	ΣĻ	NL
1,1,1-Trichloroethane	ND	ND	ND	4	50	NL
1,1,1,2-Tetrachloroethane	ND	ND	ND	NL	NL	NL
1,1,2-Trichloroethane	ND	ND.	ND	20	50	NL
1,1,1,2-Tetrachloroethane	ND	ND	ND	0.006	50	NL
1,1,2,2-Tetrachloroethane	ND	ND	ND	0.02	20	NL
1,2-Dibromo-3-chloropropane	ND	ND	ND	NL	NL	NL
1,2-Dibromoethane	DN	ND	ND	NL	NL_	NL _
1,2-Dichlorobenzene	ND	ND	ND	10	8	NL
1,2-Dichloroethane	ND	ND	ND	0.02	50	NL _
1,2-Dichloropropane	ND	ND	ND	0.009	30	NL
1,2,3-Trichlorobenzene	ND	ND	ND	NL	NL	NL
1,2,3-Trichloropropane	ND	МD	ND	NL	NL	NL
1,2,4-Trichlorobenzene	ND	ND	ND	10	0.5	NL
1,2,4-Trimethylbenzene	ND	ND	ND	NL	NL	NL -
1,3-Dichlorobenzene	ND	ND	ND	10	8	NL
1,3-Dichloropropane	ND	ND	ND	NL	NL	NL
1,3,5-Trimethylbenzene	ND	ND	ND	NL	NL	NL
1,4-Dichlorobenzene	ND	ND	ND	30	8	NL
2-Chloroethyl vinyl ether	ND	ND	ND	NL	NL	NL
2-Chlorotoluene	ND	ND	ND	NL	NL_	NL
2-Hexanone	ND	ND	ND	NL	NL	NL
2,2-Dichloropropane	ND	ND	ND	NL	NL	NL
4-Chlorotoluene	ND	ND	ND	NL	NL	NL
4-Isopropyltoluene	ND	ND	ND	NL	NL	NL
4-Methyl-2-petanone	ND	ND	ND	NL	NL	NL
Acetone	ND	0.006	ND	50	50	NL_
Benzene	ND	ND	ND	2	7	NLNL
Bromobenzene	ND	ND	ND	NL	NL	NL
Bromochloromethane	ND	ND	ND	NL	NL	NL
Bromodichloromethane	ND	ND	ND	NL_	50	NL
Bromoform	ND	ND	ND	0.8	50	NL
Carbon Disulfide	ND	.019 J+C6	ND	NL	NL	NL
Carbon Tetrachloride	ND	ND	ND	0.02	50	NL
Chlorobenzene	ND	ND	ND	1	0.5	NL
Chloroethane	ND	ND	ND_	NL	NL_	NL

Table 4-7 (cont)

Barnes Building Basement Sump Water Analytical Results VOLATILE ORGANICS

Sample:	1SW 1X	1SW 2X	1SW 2XD	MCP GW-2 Limits (c)	MCP GW-3 Limits (c)	BWSC Discharge Limt (a)
Compound		CONCEN	TRATION =	mg/L		
Chloroform	ND	ND	ND	0.4	10	NL
Chloromethane	ND	ND	ND	NL	NL	NL
cis-1,2-Dichloroethene	ND	ND	ND	NL NL	NL	NLNL
cis-1,3-Dichloropropene	ПD	ND	סא	NL	NL	NL
Dibromochloromethane	ND	ND	ND	NL	50	NL
Dibromomethane	ND	ND	ND	NL	NL	NL
Dichlorodifluoromethane	ND	ND	ND	NL	NL	NL
Ethylbenzene	ND	ND	ND	30	4	NL
Hexachlorobutadiene	ND	ND	ND	0.001	0.09	NL
lodomethane	ND	ND	ND	NL	NL	NL
Isopropylbenzene	ND	ND	ND	NL _	NL _	NL
Methylene Chloride	ND	ND	ND	50	50	NL
Methyl Ethyl Ketone	ND	ND	ND	50	50	NL
Methyl-tert-butyl ether	ND	ND	ND	50	50	NL
Naphthalene	ND	ND	ND	6 _	6	NL
n-Butylbenzene	ND	ND	ND	NL	NL	NL
n-Propylbenzene	ND	ND	ND	NL	NL	NL
sec-Butylbenzene	ND	ND	ND	NL	NL	NL -
Styrene	ND	ND	ND	0.9	50	NL
tert-Butylbenzene	ND	ND	ND	NL	NL	NL
Tetrachloroethene	ND	ND	ND	NL	NL	NL
Toluene	ND	0.019	0.016	6	50	NL(b)
trans-1,2-Dichloroethene	ND	ND	ND	NL	NL	NL NL
trans-1,3-Dichloropropene	ND	ND	ND	NL	NL	NL
Trichloroethene	ND	ND	ND	NL	NL _	NL
Trichlorofluoromethane	ND	ND	ND	NL	NL	NL
Vinyl Acetate	ND	ND	ND	NL	NL	NL
Vinyl Chloride	ND	ND	ND	0.002	0.6	NL
Xylene (total)	ND	ND	ND	6	50	NL

- (a) = Limit specified in REGULATIONS GOVERNING THE USE OF SANITARY AND COMBINED SEWERS AND STORM DRAINS OF THE BOSTON WATER AND SEWER COMMISSION
- (b) = BWSC does not specifically prohibit toluene discharges, but does prohibit discharges of gasoline, naptha (interpreted as solvent), or oils of petroleum origin.
- (c) = Current Massachusetts Contingency Plan (MCP), 310 CMR 40.0000 Limit. Table 1.

ND = NOT DETECTED
NL = NOT LISTED
J = Estimated Result

Sample

Sample Location

1SW 1X = 1SW 2X = Basement sump - oil side of oil/water separator

Basement sump - water side of oil/water separator (sump pump discharge)

1SW 2XD =

Duplicate sample of 1SW 2X

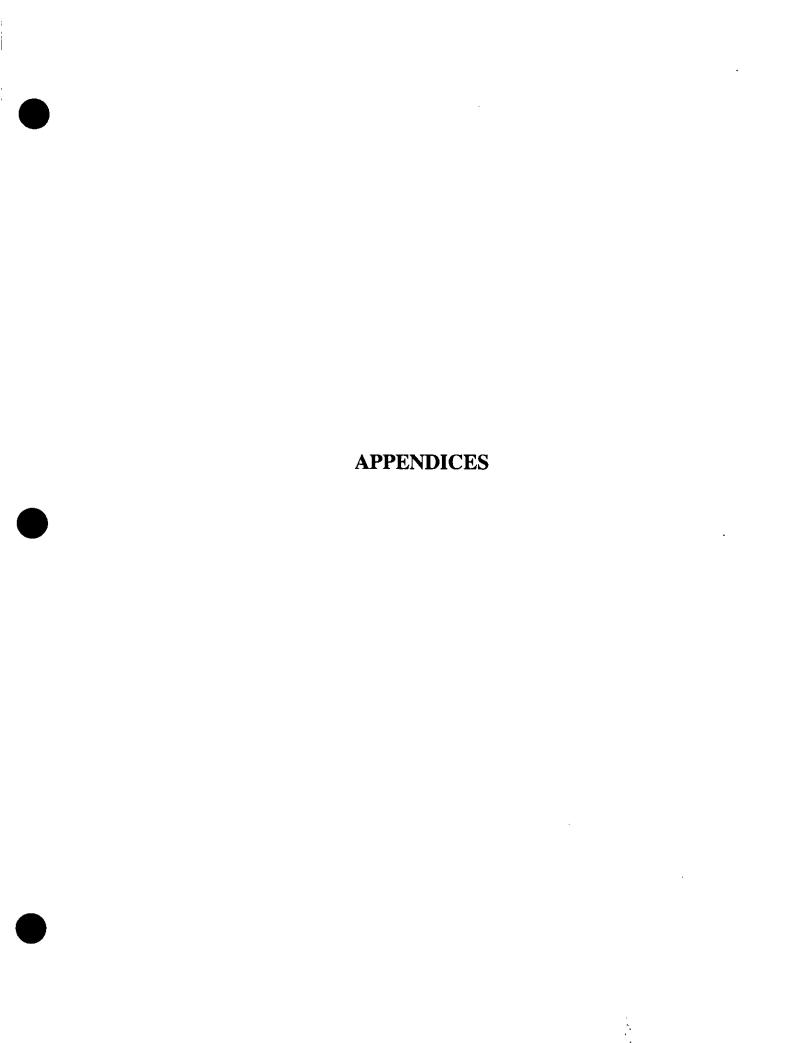
Table 4-8

Barnes Building Basement Sump Water Analytical Results FIELD WATER QUALITY MEASUREMENTS

SAMPLE LOCATION: PARAMETER	OIL SIDE	WATER SIDE	BWSC Discharge Limit (a)	UNITS
рН	8.4	8.8	5.5 < pH < 9.5	MOLES/LITER
TEMPERATURE	66.4	64.4	<150	DEGREES FARENHEIT
CONDUCTIVITY	4550	4440	NL	MICRO MHO/CM
TURBIDITY	39	35.2	NL	NTU

⁽a) = Limit specified in REGULATIONS GOVERNING THE USE OF SANITARY AND COMBINED SEWERS AND STORM DRAINS OF THE BOSTON WATER AND SEWER COMMISSION Note - The MCP does not list limits for these parameters

NL = NOT LISTED



APPENDIX A

SITE INSPECTION REPORT

Stone & Webster Barnes Building Site Inspection Report 3/Oct/96 & 4/Oct/96

Initial site inspection conducted on 3 October, 1996 by the following Stone & Webster personnel:

- Mr. Richard Skryness, Program Manager
- Mr. Kevin Scully, Project Manager
- Mr. Steven McInall, Field Team Leader
- Mr. James Skrabak, Safety Officer

The Stone & Webster inspection team traveled to the Barnes Building, located at 495 Summer Street Boston, MA and met with Mr. Henry Stanley, the Facility Manager for the Defense Support Activity Boston (DSAB). Mr. Henry provided background information regarding the building's operations and previous environmental work. Mr. Henry also led the inspection team on a tour of the building basement, the sump room in the basement, and an exterior alley where the sump room vent discharge is located. Sample locations were chosen for air quality sampling. The groundwater sump was inspected for accessibility and sampling locations and methodologies were chosen. A copy of the DSAB Installation Spill Contingency Plan (ISCB) was requested by Stone & Webster during this meeting. Mr. Henry said that he would supply this document

On 4 October, 1996 a subsequent building visit was made by Mr. Kevin Scully and Mr. Steven McInall to conduct a field screening of air quality. The field screen was conducted using a Photo-ionization Detector equipped with an 11.7 eV lamp (to screen for methylene chloride) and an LEL/O2 meter to screen for oxygen deficiencies and potentially explosive environments. The table on the following page presents the basement screening data.

Stone & Webster Barnes Building Site Inspection Report 3/Oct/96 & 4/Oct/96

Barnes Building Field Screening Results

Sample Location	% Oxygen	% LEL	CO - PPM	H2S - PPM	VOC -
					PPM (a)
Sump room	21.2	0	0	0	0.5
GW sump	21.2	0	0	0	1.5
Sump below	21.2	0	0	0	4.5
vent intake					İ
Sump room	21.2	0	0	0	0.5
- vent intake					
SW corner	21.2	0	0	0	0.5
of sump					
room					
Basement	21.2	0	0	0	0.3
area -					
outside					
sump room					
Vent	21.2	0	0	0	0.5
exhaust -					
Iman St.					

(a) = Listed measurements are the exceedance above the 1.5 PPM background registered by the instrument

Mr. Henry provided a copy of the requested ISCP during the 4 Oct. site visit.

Upon completion of the 4 Oct. building inspection, Mr. Scully and Mr. McInall visited the Boston Water and Sewer Commission office and reviewed the commission's files related to the Barnes Building. This review revealed that the Barnes Building discharges its sewage, storm water run-off, and groundwater sump into a combined sewer line located under Inman St. This combined line is ultimately routed to the Massachusetts Water Resources Authority treatment plant on Deer Island.

APPENDIX B

AIR SAMPLING ANALYTICAL DATA



Page: 1 of 6

LLI Sample No. Ao 2633481 Collected: 12/13/96 at 08:45 by KS

at 16:00

through Submitted: 12/16/96 Reported: 12/31/96

Discard: 12/31/96

ANALYSIS NAME

1AR1X Summa Canister #0066

Proj. #05000.24

CAT

NO.

Barnes Bldg. - Sump Room Vent Off

Account No: 06685

Stone & Webster Engr. Corp.

245 Summer Street Boston MA 02210

P.O. 05000.24

Rel.

4

AS RECEIVED

LIMIT OF

UNITS **RESULTS** QUANTITATION

See Page 5695 TO-14 Form 1 See Page

GC/MS Air TIC Form Upload 6900 TO 14 VOA Extended List see form I 7199 TO 14 VOA Extended List cont. see form I 7200

1 COPY TO Stone & Webster Engr. Corp. ATTN: Mr. Steve McInall

Questions? Contact your Client Services Representative at (717) 656-2300 128864 546082 04:46:09 D 0001 204 0.00 00031850 DIS000

Respectfully Submitted Richard Entz. B.A. Sr. Technical Specialist



II to Rev Eli Ho





2 of 6 Page

VOLATILE ORGANICS IN AIR SUMMA CANISTER SAMPLE ANALYSIS DATA SHEET

Sample No.: 1AR1X Lab Sample ID: 2633481 Canister ID: SUMMA0066 Injection Volume: 500 cc Nominal Volume: 250 cc Instrument ID: HP4224

Date Collected: 12/13/96 Date Received: 12/16/96 Date Analyzed: 12/19/96 Time Analyzed: 08:43 Pressure Rec'd: 10.8 psia Final Pressure: 21.7 psia Dilution Factor: 1.0

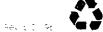
Lab File ID: C:\HPCHEM\1\DATA\DEC18\2701028.D

CAS RN	COMPOUND NAME	CONCENTRATION (ppb(v))	Q
75-71-8	Dichlorodifluoromethane	1	
76-14-2	Freon 114	1	U
74-87-3	Chloromethane	1	Ų
75-01-4	Vinyl Chloride	1	U
74-83-9	Bromomethane	1	Ü
75-00-3	Chloroethane	1 5 1 1 1 1 1	U
75-69-4	Trichlorofluoromethane	5	
75-35-4	1.1-Dichloroethene	1	U
76-13-1	Freon 113	1	U
107-05-1	3-Chloropropene	1	U
75-09-2	Methylene Chloride	1	U
75-34-3	1,1-Dichloroethane	1	U
156-59-2	cis-1,2-Dichloroethene	1	U
67-66-3	Chloroform	1	U
71-55-6	1,1,1-Trichloroethane	1 1	U
56-23-5	Carbon Tetrachloride		U
107-06-2	1.2-Dichloroethane	19	
71-43-2	Benzene	1	U
79-01-6	Trichloroethene	1	U
78-87-5	1,2.Dichloropropane	1	U
10061-01-5	cis-1.3-Dichloropropene	1	U
108-88-3	Toluene	4	
10061-02-6	trans-1.3-Dichloropropene	1	U
79-00-5	1,1,2-Trichloroethane	1	Ų
127-18-4	Tetrachloroethene	1	
106-93-4	1.2-Dibromoethane	1	U
108-90-7	Chlorobenzene	1	U
100-41-4	Ethylbenzene	1	U
1330-20-7	m/p-Xylene	1	U
95-47-6	o-Xylene	1	U
100-42-5	Styrene	1	U
79-34-5	1.1.2.2-Tetrachloroethane	ĺ	U
622-96-8	4-Ethyltoluene	1	U
108-67-8	1,3.5-Trimethylbenzene	1	Ú

U = Compound was undetected at the specified limit of quantitation.

B = Compound was found in method blank. D = analysis of diluted sample.







Page 3 of 6

VOLATILE ORGANICS IN AIR SUMMA CANISTER SAMPLE ANALYSIS DATA SHEET

Sample No.: 1AR1X Lab Sample ID: 2633481 Canister ID: SUMMA0066 Injection Volume: 500 cc

Instrument ID: HP4224

Date Collected: 12/13/96 Date Received: 12/16/96 Date Analyzed: 12/19/96 Time Analyzed: 08:43 Pressure Rec'd: 10.8 psia Final Pressure: 21.7 psia Nominal Volume: 250 cc Dilution Factor: 1.0 Lab File ID: C:\HPCHEM\1\DATA\DEC18\2701028.D

CAS RN	COMPOUND NAME	CONCENTRATION (ppb(v))	Q
95-63-6 541-73-1 106-46-7 100-44-7 95-50-1 120-82-1 87-68-3	1,2,4-Trimethylbenzene 1,3-Dichlorobenzene 1,4-Dichlorobenzene Benzyl chloride 1,2-Dichlorobenzene 1,2,4-Trichlorobenzene Hexachlorobutadiene	1 1 1 1 1 1 1 1	

U = Compound was undetected at the specified limit of quantitation.

B = Compound was found in method blank. D = analysis of diluted sample.







Page 4 of 6

VOLATILE ORGANICS IN AIR SUMMA CANISTER SAMPLE TENTATIVELY IDENTIFIED COMPOUNDS

Sample No.: 1AR1X Lab Sample ID: 2633481 Canister ID: SUMMA0066

Injection Volume: 500 cc Instrument ID: HP4224

Date Collected: 12/13/96 Date Analyzed: 12/19/96 Pressure Rec'd: 10.8 psia Nominal Volume: 250 cc Date Received: 12/16/96 Time Analyzed: 08:43 Final Pressure: 21.7 psia Dilution Factor: 1.0

Lab File ID: C:\HPCHEM\1\DATA\DEC18\2701028.D UNITS = ppb(v)

CAS RN	COMPOUND NAME	R.T.	ESTIMATED CONCENTRATION	Q
75-28-5 106-97-8 78-78-4 109-66-0 67-64-1	Butane, 2-methyl- Pentane Acetone Pentane, 2-methyl- Unknown aliphatic hydrocarbon-C5	5.89 6.45 6.93 8.46 9.18 10.51 11.65 12.29 12.91 19.00	92 36 31 5 3 3 4 4 4 2	J J J J J J J J J J J J J J J J J J J





B = Compound was found in method blank. D = analysis of diluted sample. J = Estimated concentration assuming identical response factor to that of the internal standard with retention time closest to the TIC.

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QUALITY CONTROL REPORT

Page: 5 of 6

LLI Sample No. 2633481 1ARIX Summa Canister #0066

Proj. #05000.24

Barnes Bldg. - Sump Room Vent Off

Group No. 546082 Stone & Webster Engr. Corp.

Sample

Sample

DUP RPD

MSD

RPD

LCS LCS

LCS LCS LIMITS LOW HIGH

RPD

LOQ

UNITS

BLANK

Batch: A96352112

7199 TO 14 VOA Extended List 7202 Dichlorodifluoromethane

1.0 ppbv

7204 Freon 114

1.0 ppbv

7205 Chloromethane

1.0 ppbv

7206 Vinyl Chloride 1.0 ppbv

7208 Bromomethane

1.0 ppbv

7209 Chloroethane 1.0 ppbv

7212 Trichlorofluoromethane

1.0 ppbv 5 1.1-Dichloroethene

1.0 ppbv

7216 Freon 113

1.0 ppbv

7221 3-Chloropropene

1.0 ppbv

7222 Methylene Chloride 1.0 ppbv

7227 1.1-Dichloroethane

1.0 ppbv 7230 cis-1,2-Dichloroethene 1.0 ppbv

7234 Chloroform

1.0 ppbv

7235 1,1,1-Trichloroethane

1.0 ppbv

7236 Carbon Tetrachloride

1.0 ppbv

7237 1,2-Dichloroethane

1.0 ppbv 7238 Benzene

1.0 ppbv

7200 TO 14 VOA Extended List cont. Batch: A96352112

-------7241 Trichloroethene

1.0 ppbv 7243 1.2-Dichloropropane

1.0 ppbv

7248 cis-1,3-Dichloropropene

1.0 ppbv 7250 Toluene

1.0 ppbv





QUALITY CONTROL REPORT

LCS

RPD

LCS

DUP

LCS

RPD



BLANK

Page: 6 of 6

LCS LIMITS

LOW HIGH

LLI Sample No. 2633481 1ARIX Summa Canister #0066 Proj. #05000.24

Barnes Bldg. - Sump Room Vent Off

Group No. 546082 Stone & Webster Engr. Corp.

MS

MSD

DUP

RPD

Sample Sample UNITS LOQ 7252 trans-1,3-Dichloropropene 1.0 ppbv 7254 1.1.2 Trichloroethane 1.0 ppbv 7255 Tetrachloroethene 1.0 ppbv 1.0 ppbv 1.0 ppbv 1.0 ppbv 64 Styrene

1.0 ppbv 1.0 ppbv 1.0 ppbv ppbv 1.0 7279 1,2,4-Trichlorobenzene

1.0 ppbv 7280 Hexachlorobutadiene 1.0 ppbv

1.0 ppbv 7258 1,2-Dibromoethane 1.0 ppbv 7259 Chlorobenzene 7261 Ethyl Benzene 7262 m/p-Xylene 7263 o-Xylene 1.0 ppbv 7267 1,1,2,2.Tetrachloroethane 1.0 ppbv 7270 4-Ethyltoluene 1.0 ppbv 7271 1.3.5-Trimethylbenzene 1.0 ppbv 7273 1.2,4-Trimethylbenzene 7274 1,3-Dichlorobenzene 7275 1.4 Dichlorobenzene 7276 Benzyl chloride 1.0 ppbv 7277 1.2-Dichlorobenzene





Page: 1 of 6

LLI Sample No. Ao 2633480 Collected: 12/12/96 at 09:08 by KS

through at 15:58

Submitted: 12/16/96 Reported: 12/31/96

Discard: 12/31/96

2AR1X Summa Canister #0070

Proj. #05000.24

Barnes Bldg. - Sump Room Vent On

Account No: 06685

Stone & Webster Engr. Corp.

245 Summer Street Boston MA 02210

P.O. 05000.24

Rel.

AS RECEIVED

LIMIT OF

RESULTS

QUANTITATION UNITS

5695 TO-14 Form 1 6900

ANALYSIS NAME

CAT

NO.

7199

7200

GC/MS Air TIC Form Upload TO 14 VOA Extended List

TO 14 VOA Extended List cont.

see form I see form I

See Page 2 See Page 4

1 COPY TO Stone & Webster Engr. Corp.

ATTN: Mr. Steve McInall

Questions? Contact your Client Services Representative at (717) 656-2300 04:45:45 D 0001 3 128864 546082 204 0.00 00031850 DIS000

> Respectfully Submitted Richard Entz, B.A. Sr. Technical Specialist



27 : Re. 80 %







2 of 6 Page

VOLATILE ORGANICS IN AIR SUMMA CANISTER SAMPLE ANALYSIS DATA SHEET

Sample No.: 2AR1X Lab Sample ID: 2633480 Canister ID: SUMMA0070 Injection Volume: 500 cc

Instrument ID: HP4224

Date Received: 12/16/96 Date Collected: 12/12/96 Date Analyzed: 12/30/96 Time Analyzed: 12:44

Pressure Rec'd: 11.1 psia Final Pressure: 22.1 psia Nominal Volume: 250 cc Dilution Factor: 1.0 Lab File ID: C:\HPCHEM\1\DATA\DEC30\0601006.D

CAS RN	COMPOUND NAME	CONCENTRATION (ppb(v))	Q
75-71-8	Dichlorodifluoromethane	6	
76 - 14 - 2	Freon 114	1	U
74-87-3	Chloromethane	1	U
75-01-4	Vinyl Chloride	1	U
74-83-9	Bromomethane	1	U
75-00-3	Chloroethane	1	U
75-69-4	Trichlorofluoromethane	2 1	
75-35-4	1.1-Dichloroethene	1	U
76 - 13 - 1	Freon 113	1	U
107-05-1	3-Chloropropene	1	U
75-09-2	Methylene Chloride	1	U
75-34-3	1,1-Dichloroethane	1	U
156-59-2	cis-1,2-Dichloroethene	1	U
67-66-3	Chloroform	1 1 1	U
71-55-6	1.1.1-Trichloroethane	1	U
56-23-5	Carbon Tetrachloride	1	U
107-06-2	1.2-Dichloroethane	15	
71-43-2	Benzene	1	U
79-01-6	Trichloroethene	1	U
78-87-5	1.2-Dichloropropane	1	U
10061-01-5	cis-1,3-Dichloropropene	1	U
108-88-3	Toluene	5	
10061-02-6	trans-1.3-Dichloropropene	1	υ
79-00-5	1.1.2 Trichloroethane	1	U
127-18-4	Tetrachloroethene	1	
106-93-4	1.2-Dibromoethane	1	U
108-90-7	Chlorobenzene	1	Ų
100-41-4	Ethylbenzene	1	U
1330-20-7	m/p-Xylene	1	
95-47-6	o-Xylene	Ī	U
100-42-5	Styrene	1	Ū
79-34-5	1,1,2,2-Tetrachloroethane	$\bar{1}$	Ū
622-96-8	4-Ethyltoluene	1	Ŭ
108-67-8	1,3,5-Trimethylbenzene	î	Ŭ

U = Compound was undetected at the specified limit of quantitation.

B = Compound was found in method blank. D = analysis of diluted sample.









Page 3 of 6

VOLATILE ORGANICS IN AIR SUMMA CANISTER SAMPLE ANALYSIS DATA SHEET

Sample No.: 2AR1X Lab Sample ID: 2633480

Date Collected: 12/12/96 Date Received: 12/16/96 Date Analyzed: 12/30/96 Time Analyzed: 12:44 Canister ID: SUMMA0070 Pressure Rec'd: 11.1 psia Final Pressure: 22.1 psia Injection Volume: 500 cc Instrument ID: HP4224 Lab File ID: C:\HPCHEM\1\DATA\DEC30\0601006.D

CAS' RN	COMPOUND NAME	CONCENTRATION (ppb(v))	Q
95-63-6	1.2.4-Trimethylbenzene	1	
541-73-1	1.3-Dichlorobenzene	1	U
106-46-7	1,4-Dichlorobenzene	1	U
100-44-7	Benzyl chloride	1	U
95-50-1	1,2-Dichlorobenzene	1	U
120-82-1	1,2,4-Trichlorobenzene	1	υ
87-68-3	Hexachlorobutadiene	1	U

U = Compound was undetected at the specified limit of quantitation.

B = Compound was found in method blank. D = analysis of diluted sample.







Page 4 of 6

VOLATILE ORGANICS IN AIR SUMMA CANISTER SAMPLE TENTATIVELY IDENTIFIED COMPOUNDS

Sample No.: 2AR1X Lab Sample ID: 2633480 Canister ID: SUMMA0070 Injection Volume: 500 cc Instrument ID: HP4224

Date Collected: 12/12/96 Date Received: 12/16/96 Date Analyzed: 12/30/96 Time Analyzed: 12:44 Pressure Rec'd: 11.1 psia Final Pressure: 22.1 psi

Pressure Rec'd: 11.1 psia Final Pressure: 22.1 psia Nominal Volume: 250 cc Dilution Factor: 1.0 Lab File ID: C:\HPCHEM\1\DATA\DEC30\0601006.D UNITS = ppb(v)

CAS RN	COMPOUND NAME	R.T.	ESTIMATED CONCENTRATION	Q
74-98-6 75-28-5 106-97-8 78-78-4 109-66-0 67-64-1 107-83-5	Propane Isobutane Butane Butane, 2-methyl- Pentane Acetone Pentane, 2-methyl- Unknown aliphatic hydrocarbon-C7	5.84 6.41 6.88 8.39 9.11 10.43 11.58 12.21	68 34 28 12 3 3 3	
127-19-5	Acetamide, Ń.N-dimethyl- Unknown alicyclic hydrocarbon-C10	24.46 26.77		j

B = Compound was found in method blank. D = analysis of diluted sample. J = Estimated concentration assuming identical response factor to that of

the internal standard with retention time closest to the TIC.





QUALITY CONTROL REPORT



Page: 5 of 6

LLI Sample No. 2633480 2ARIX Summa Canister #0070 Proj. #05000.24 Barnes Bldg. - Sump Room Vent On

Group No. 546082 Stone & Webster Engr. Corp.

New television of the environment of the property of the least

Sample Sample DUP LCS LCS LIMITS LOQ['] UNITS BLANK RPD MS MSD DUP RPD LOW HIGH

7199 TO 14 VOA Extended List Batch: A963541112 7202 Dichlorodifluoromethane 1.0 ppbv 7204 Freon 114 1.0 ppby 7205 Chloromethane 1.0 ppbv 7206 Vinyl Chloride 1.0 ppbv 7208 Bromomethane 1.0 ppbv 7209 Chloroethane 1.0 ppbv 7212 Trichlorofluoromethane 1.0 ppbv 5 1.1-Dichloroethene 1.0 ppbv 7216 Freon 113 1.0 ppbv 7221 3-Chloropropene 1.0 ppbv 7222 Methylene Chloride 1.0 ppbv 7227 1.1-Dichloroethane 1.0 ppbv 7230 cis-1,2-Dichloroethene 1.0 ppbv 7234 Chloroform 1.0 ppbv 7235 1.1.1-Trichloroethane 1.0 ppbv 7236 Carbon Tetrachloride 1.0 ppbv 7237 1.2-Dichloroethane 1.0 ppbv 7238 Benzene 1.0 ppbv 7200 TO 14 VOA Extended List cont. Batch: A963541112 7241 Trichloroethene 1.0 ppbv 7243 1,2-Dichloropropane 1.0 ppby 7248 cis-1,3-Dichloropropene



in Entre in No. 1 - Entre A∆in Hin English 1 - HBH Sheffin Haw Thirtham Sheffi

1.0 ppbv 7250 Toluene 1.0

ppby



QUALITY CONTROL REPORT



BLANK

Page: 6 of 6

LLI Sample No. 2633480 2AR1X Summa Canister #0070 Proj. #05000.24 Barnes Bldg. - Sump Room Vent On

Sample

Group No. 546082 Stone & Webster Engr. Corp.

LOQ UNITS 7252 trans-1,3-Dichloropropene 1.0 ppbv 7254 1,1,2-Trichloroethane 1.0 ppbv 7255 Tetrachloroethene 1.0 ppbv 7258 1.2-Dibromoethane 7259 Chlorobenzene 1.0 vdag 7261 Ethyl Benzene 1.0 ppby 7262 m/p-Xylene $1.0^{'}$ ppbv 7263 o-Xylene

Sample

7263 0-Aytene
1.0 ppbv
7264 Styrene
1.0 ppbv
71.1.2.2-Tetrachloroethane
1.0 ppbv
7370 4 5+bultabloope 7270 4-Ethyltoluene 1.0 ppbv 7271 1.3.5-Trimethylbenzene 1.0 ppbv 7273 1,2,4-Trimethylbenzene 1.0 ppbv 7274 1.3-Dichlorobenzene 1.0 ppbv 7275 1,4-Dichlorobenzene 1.0 ppbv 7276 Benzyl chloride 1.0 ppbv 7277 1.2-Dichlorobenzene 1.0 ppbv 7279 1.2.4-Trichlorobenzene ppbv 7280 Hexachlorobutadiene 1.0

ppbv

DUP 1.05 LCS LCS LIMITS MS MSD LCS RPD RPD DUP RPD LOW HIGH



Herrestell et violent in expliantation in symbolic latiblishmes afford

Analysis Report



Page: 1 of 6

LLI Sample No. AQ 2633482 Collected: 12/13/96 at 08:45 by KS

at 16:00 through Submitted: 12/16/96 Reported: 12/31/96

Discard: 12/31/96

3AR1X Summa Canister #0114

Proj. #05000.24

Barnes Bldg. - Boiler Room Vent Off

TO 14 VOA Extended List cont.

Account No: 06685

Stone & Webster Engr. Corp.

245 Summer Street Boston MA 02210

P.O. 05000.24 Rel.

AS RECEIVED

LIMIT OF

RESULTS QUANTITATION UNITS

TO-14 Form 1 5695

ANALYSIS NAME

CAT NO.

7200

GC/MS Air TIC Form Upload 6900 7199 TO 14 VOA Extended List

see form I

see form I

See Page 2 See Page

1 COPY TO Stone & Webster Engr. Corp. ATTN: Mr. Steve McInall

Questions? Contact your Client Services Representative at (717) 656-2300 128864 546082 04:46:33 D 0001

to to the contract of the

0.00 00031850 DIS000 204

> Respectfully Submitted Richard Entz, B.A. Sr. Technical Specialist









2 of 6 Page

VOLATILE ORGANICS IN AIR SUMMA CANISTER SAMPLE ANALYSIS DATA SHEET

Sample No.: 3AR1X Lab Sample ID: 2633482 Canister ID: SUMMA0114 Injection Volume: 500 cc

Instrument ID: HP4224

Date Received: 12/16/96 Date Collected: 12/13/96 Date Analyzed: 12/19/96 Time Analyzed: 22:54 Pressure Rec'd: 8.5 psia Final Pressure: 21.2 psia Nominal Volume: 250 cc Dilution Factor: 1.2

Lab File ID: C:\HPCHEM\1\DATA\DEC19\1201012.D

		CONCENTRATION (ppb(v))	Q
75-71-8	Dichlorodifluoromethane	6	D
76-14-2	Freon 114	1 1	U
74-87-3	Chloromethane	1	D
75-01-4	Vinyl Chloride	1 1	U
74-83-9	Bromomethane	1 1	U
75-00-3	Chloroethane	1	U
75-69-4	Trichlorofluoromethane	3 1	D
75 - 35 - 4	1.1-Dichloroethene	1 1	U
76-13-1	Freon 113	1	U
107-05-1	3-Chloropropene	1	U
75-09-2	Methylene Chloride	1	U
75 - 34 - 3	1,1-Dichloroethane	1	U
156-59-2	cis-1,2-Dichloroethene	1 1	U
67-66-3	Chloroform	1 1	U
71-55-6	1.1,1-Trichloroethane	1	U
56-23-5	Carbon Tetrachloride	1	U
107-06-2	1.2-Dichloroethane	4	D
71-43-2	Benzene	1	U
79-01-6	Trichloroethene	1	U
78-87-5	1,2.Dichloropropane	1	U
10061-01-5	cis-1.3-Dichloropropene	1	U
108-88-3	Toluene	14	D
10061-02-6	trans-1,3-Dichloropropene	1	U
79-00-5	1.1.2-Trichloroethane	1	U
127-18-4	Tetrachloroethene	1	U
106-93-4	1,2-Dibromoethane	1 1	U
108-90-7	Chlorobenzene	1	U
100-41-4	Ethylbenzene	1 1	U _
1330-20-7	m/p-Xylene	2	. D
95-47-6	o-Xylene		U
100-42-5	Styrene		U
79-34-5	1,1,2,2-Tetrachloroethane		U
622-96-8	4-Ethyltoluene	1	U
108-67-8	1.3.5-Trimethylbenzene	1	U

U = Compound was undetected at the specified limit of quantitation. B = Compound was found in method blank. D = analysis of diluted sample. NOTE: Limits of quantitation were raised due to the high concentration of volatile organic compounds in this sample.







3 of 6 Page

VOLATILE ORGANICS IN AIR SUMMA CANISTER SAMPLE ANALYSIS DATA SHEET

Sample No.: 3AR1X Lab Sample ID: 2633482

Date Received: 12/16/96 Date Collected: 12/13/96 Time Analyzed: 22:54 Date Analyzed: 12/19/96 Canister ID: SUMMA0114 Pressure Rec'd: 8.5 psia Final Pressure: 21.2 psia Injection Volume: 500 cc Nominal Volume: 250 cc Dilution Factor: 1.2 Instrument ID: HP4224 Lab File ID: C:\HPCHEM\1\DATA\DEC19\1201012.D

CAS RN	COMPOUND NAME	CONCENTRATION (ppb(v))	Q
95-63-6	1.2,4-Trimethylbenzene	2	D
541-73-1	1.3-Dichlorobenzene	1	U
106-46-7	1.4-Dichlorobenzene	1	U
100-44-7	Benzyl chloride	1	U
95-50-1	1.2-Dichlorobenzene	1 1	U
120-82-1	1,2,4-Trichlorobenzene	1 1	U
87-68-3	Hexachlorobutadiene	1	U
}	•	'	

U = Compound was undetected at the specified limit of quantitation. B = Compound was found in method blank. D = analysis of diluted sample. NOTE: Limits of quantitation were raised due to the high concentration of volatile organic compounds in this sample.







Page 4 of 6

VOLATILE ORGANICS IN AIR SUMMA CANISTER SAMPLE TENTATIVELY IDENTIFIED COMPOUNDS

Sample No.: 3AR1X Lab Sample ID: 2633482 Canister ID: SUMMA0114 Injection Volume: 500 cc Nominal Volume: 250 cc Instrument ID: HP4224

Date Collected: 12/13/96 Date Analyzed: 12/19/96

Date Received: 12/16/96 Time Analyzed: 22:54 Pressure Rec'd: 8.5 psia Final Pressure: 21.2 psia

Dilution Factor: 1.2 Lab File ID: C:\HPCHEM\1\DATA\DEC19\1201012.D

UNITS = ppb(v)

CAS RN	COMPOUND NAME	R.T.	ESTIMATED CONCENTRATION	Q
106-97-8 75-07-0 78-78-4 109-66-0 64-17-5 67-64-1	Acetaldehyde Butane. 2-methyl- Pentane	5.91 6.48 6.96 7.32 8.48 9.20 9.56 10.53 11.69 12.32	18 26 16 4 37 3 3 8 3 3	J D D D D D D D D D D D D D D D D D D D

B = Compound was found in method blank. D = analysis of diluted sample.





J = Estimated concentration assuming identical response factor to that of the internal standard with retention time closest to the TIC.

QUALITY CONTROL REPORT



Page: 5 of 6

LLI Sample No. 2633482 3AR1X Summa Canister #0114

Proj. #05000.24 Barnes Bldg. . Boiler Room Vent Off Group No. 546082 Stone & Webster Engr. Corp.

MS

Sample Sample L00 UNITS

BLANK

DUP RPD

MSD

RPD

LCS DUP

LCS

LCS RPD

LCS LIMITS LOW HIGH

7199 TO 14 VOA Extended List

Batch: A96354111

7202 Dichlorodifluoromethane

1.0 ppbv 7204 Freon 114

1.0 ppbv

7205 Chloromethane

1.0 ppbv

7206 Vinyl Chloride 1.0 ppbv

7208 Bromomethane

1.0 ppbv

7209 Chloroethane 1.0 ppbv

7212 Trichlorofluoromethane

1.0 ppbv

5 1.1-Dichloroethene 1.0 ppbv ppbv

7216 Freon 113

1.0 ppbv

7221 3 Chloropropene

1.0 ppbv

7222 Methylene Chloride 1.0 ppbv

7227 1.1-Dichloroethane

1.0 ppbv

7230 cis·1.2 Dichloroethene

1.0 ppbv

7234 Chloroform

1.0 ppbv

7235 1.1.1-Trichloroethane

1.0 ppbv

7236 Carbon Tetrachloride

1.0 ppbv

7237 1.2 Dichloroethane

1.0 ppbv 7238 Benzene

1.0 ppbv

7200 TO 14 VOA Extended List cont. Batch: A96354111

7241 Trichloroethene

1.0 ppbv

7243 1.2-Dichloropropane

1.0 ppby

7248 cis-1,3-Dichloropropene 1.0 ppbv

7250 Toluene

1.0 ppby





QUALITY CONTROL REPORT



6

Page: 6 of

LLI Sample No. 2633482
3ARIX Summa Canister #0114 Proj. #05000.24 Barnes Bldg. - Boiler Room Vent Off

Group No. 546082 Stone & Webster Engr. Corp.

DUP LCS LIMITS Sample LCS LCS Sample LOQ' UNITS BLANK RPD MS MSD RPD LCS DUP RPD LOW HIGH

7252 trans-1,3-Dichloropropene 1.0 ppbv 7254 1.1.2 Trichloroethane 1.0 ppbv 7255 Tetrachloroethene 1.0 ppbv 7258 1.2-Dibromoethane 1.0 ppbv 7259 Chlorobenzene 1.0 ppbv 7261 Ethyl Benzene 1.0 ppbv 7262 m/p-Xylene 1.0 ppbv 7263 o-Xylene 1.0 ppbv 3264 ⁻Styrene 1.0 ppbv 7 1.1,2.2-Tetrachloroethane 1.0 ppbv 7270 4-Ethyltoluene 1.0 ppbv 7271 1,3.5-Trimethylbenzene 1.0 ppbv 7273 1,2,4-Trimethylbenzene

1.4 Dichlorobenzene 1.0 ppbv 7276 Benzyl chloride 1.0 ppbv 7277 1,2-Dichlorobenzene 1.0 _ ppbv 1,2,4-Trichlorobenzene 1.0 ppbv 7280 Hexachlorobutadiene 1.0

ppby

1.0 ppbv 7274 1,3-Dichlorobenzene 1.0 ppbv



MEMBER JANGAR STA 20 1 200 - Stell 64 1 5 0 1 5 5 M-556 171 - Skill 1766 1568



Explanation of Symbols and Abbre dations

Briming the common symbols and appreciations used in reporting Continual Cata

iEt.	nond detected	BMQL	Below Minimum Guentitation Lit
777 770	Too Numerous To Count	MPN	Most Propable Number
10	international Units	CP Units	copalt-enioropiatinate units
milios/cm	micromhos (em)	UTA	nephelometric turbidity units
С	aegrees Ceisius	F	begrees Fanrenheit
Cal	(ciet) calories	lb.	pound(s)
meq	miliequivalents	kg	kilogramis:
9	gramis:	mg	miliigramis)
ug	milorogram(s)	Į.	lmer(s)
m!	milliliter(s)	ul	microliter(s)
m3	cubic meter(s)	fib > 5 um/mi	fibers greater than 5 microns in length per ma

- less than The number following the sign is the <u>limit of guantitation</u>, the smallest amount of analyte which car, be reliably determined using this specific test.
- greater than
- pans par million. One ppm is equivalent to one milligram per kilogram (mg. r.g., or one gram per million grams. For aqueous liquids, ppm is usually taken to be equivalent to milligrams per liter img. I), because one liter of water has a weight very close to a kilogram. For gases or vapors, one ppm is equivalent to one microliter of gas per liter of gas.
- ppb parts per billion
- Dry Results brinted under this heading have been adjusted for moisture content. This increases the analyte weight concentration to approximate the value present in a similar sample without moisture.

J.E. EPA data qualifiers.

	Organic Qualifiers	Inorganic Qualifiers								
ABCDE	TIC is a possible aldol-condensation product Analyte was also detected in the brank Pesticide result confirmed by GC/MS Compound quantitated on a diluted sample Concentration exceeds the calibration range of the instrument	BE MNS	Value is <crdl, (msa)="" additions="" but="" control="" due="" duplicate="" estimated="" injection="" interference="" limits="" met="" method="" not="" of="" precision="" sample="" spike="" standard="" th="" to="" used<="" within="" ≥idl=""></crdl,>							
J	Estimated value Presumptive evidence of a compound (TIC's only) Concentration difference between primary and confirmation columns >25%	U W +	for calculation Compound was not detected Post digestion spike out of control limits Dublicate analysis not within control limits Correlation coefficient for MSA <0.995							
Д.М.Д	Compound was not detected Defined in case narrative									

Tests results relate only to the sample tested. Clients should be aware that a critical ster in a chemical or microb plogical analysis is the collection of the sample. Unless the sample analyzed is truly representative of the bulk material involved, the test results will be meaningless. If you have objections rogic ding the proper techniques of collecting samples, please contact us. We cannot be held responsible for sample integrity, however, unless sampling has been performed by a member of our staff. This report shall not be reproduced except in full, without the written approval of the laboratory.

WARRANTY AND LIMITATION OF LIABILITY - In accepting analytical work, we warrant the accuracy of test results for the sample as submitted. We disclaim any other warranties, express or implied including a Warranty of Fitness for Particular Purpose and Warranty of Merchantability. We accept no responsibility for the purpose for which the client uses the test results. No purchase order or other order for work shall be accepted by the company with any conditions that vary from our Standard Terms and Conditions. If Lancaster Laporatories performs work recuested by the client, conditions at variance to our Standard Terms and Conditions are not part of the contract.



For Lancaster Laboratories use only

Acct. # 6675 Sample # 26.33480 - 80

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Type II (Tier III) Other	Iff yes indicate QC sample and			Relir	iquish	ed by		-					te	lime	Received by			<u>.</u>		Da		lirne	-
Type III (NJ Red. Del.) Type IV. rc TP)	Internal Chain of Custo	ody required	d? Yes No	Relinquished by										-					1 de	10/4	76	17.3	

APPENDIX C

GROUNDWATER SUMP ANALYTICAL DATA



Client: Stone & Webster Engineering Corp.

Client Project: Barnes Building

Lab Project: C1515

Date Samples Received: 12/13/96

Project Narrative

This data package included the analysis result for five (5) aqueous samples that were received from Stone & Webster Engineering Corp. on December 13, 1996. Analyses were performed per specification in the Chain of Custody. For reference, a copy of the Mitkem Sample Log-In form is included for cross-referencing the Client sample ID and Laboratory sample ID.

The following observations were made for the analysis:

Metals: The analysis results are tabulated to the Instrument Detection Limit.

Oil & Grease: Sample 1SW 2X was analyzed as duplicate for QAQC.

Total Petroleum Hydrocarbons: None

VPH: None

EPH: None

8260A: Chromatograms and TIC are included as per project requirement.

8081: The standard calibration deviated more than the method requirement (15% or less deviation) for a few target analytes including endrin (69%), 4,4'-DDD (23%), 4,4'-DDT (19%) and methoxychlor (36%). The extracts were not re-analyzed since these target analytes were not detected in the samples.



All of the analyses were performed according to method requirement. No unusual observation was made for the analysis other than those mentioned above.

The enclosed data package has been reviewed and is authorized for release as evidenced by the signature below.

Anjana K. Saini, PhD QA/QC Director



March 4, 1997

Mr. Kevin Scully Stone & Webster Engineering Corporation 245 Summer Street Boston, MA 02210

SUBJECT: Barnes Building Project

Dear Kevin:

Per various conversations over the last week or so between Brian Tucker (S&W), Kin Chiu (Mitkem) and myself, I have prepared the following response:

- With regards to the Lab Control Sample for metals from December 19, 1996 (Lab ID#: 1219LSCW), the revised report containing Scienium and Thallium was submitted under separate cover dated February 18, 1997.
- 2. For Oil & Grease analysis, Mitkem typically performs duplicate for QA/QC. For this project, Mitkem received three 1-liter aliquots for Oil & Grease QA/QC for Sample ID ISW2. The prep lab staff mistakenly followed normal Mitkem procedure and used two of the three bottles to prepare the sample and its duplicate. This oversight was brought to the laboratory's attention after our conference call on January 15, 1997. We were unable to perform the MS/MSD as requested because only one of the three original sample bottles remained, leaving an insufficient sample volume for the requested analyses.
- See attached for revised report for VOC 8260A Lab Control Sample.
- 4. See attached for the time report for volatiles analysis from December 26, 1996.
- 5. See attached for revised MS/MSD Summary pages.

If you have any questions regarding this submittal, please contact either Kin Chiu or myself at the number listed below. We apologize for any inconvenience this may have caused you and Stone & Webster.

Regards.

Paul A. Senecal Marketing Director

PAS/mam

cc: Brian Tucker - S&W

175 Metro Center Boulevard • Warwick, Rhode Island 02886-1755 • (401) 732-3400 • Fax (401) 732-3499 1232 East Broadway, Suite 210 • Tempe, Arizona 85282 • (602) 303-9535 • Fax (602) 921-2883 email: mitkem19@mail.idt.net

Data Qualifiers:

- J This flag indicates an estimated value due to either
 - the compound was detected at below the Reporting Limit, or
 - estimated concentration for Tentatively Identified Compound
- B This flag indicates the analyte was also detected in the associated Method Blank
- D This flag indicates the analyte concentration was obtained from a diluted analysis
- E This flag indicates the analyte concentration exceeded the Calibration Range
- P This flag is used for Pesticides/PCB/Herbicide analyte when there is a greater than 50% difference for detected concentration between the two GC columns used for Primary and Confirmation analyses. The lower of the two values is reported in the Analysis Report.
- UJ Estimate all detection levels
- U Compound was not detected. The associated numerical value is the compound quantitation limit



Analysis Report: Oil & Grease - Gravimetric

Client: Stone & Webster Engineering Corp.

Analysis: Method 413.1

Matrix: Aqueous

Concentration in: mg/L

	Reporting			
<u>Lab ID</u>	Client ID	Result	<u>Limit</u>	<u>Analysis Date</u>
C1515-01	1SW 2X	4	1	12/31/96
C1515-01 DUP	1SW 2X DUP	6	1	12/31/96
C1515-02	1SW 2D	6	1	12/31/96
C1515-03	1SW 1X	90	1	12/31/96

QA/QC

Method Blank

O & G 1231-B1 ND 1 12/31/96

ND= Not detected

0004



Analysis Report: Total Petroleum Hydrocarbons

Reporting

<u>Limit</u>

1

Client: Stone & Webster Engineering Corp.

Client ID

1SW 2X

Analysis: Method 418.1

Matrix: Aqueous

Lab ID

C1515-01

Concentration in: mg/L

ND = Not Detected

C1515-02 1SW 2D C1515-03 1SW 1X	7 250	1 75	12/26/96 12/26/96
QA/QC Method Blank 1219-B1	ND	1	12/26/96
Lab Control Sample (% Recovery) 1219-LCS1	99		12/26/96
Matrix Spike (% Recovery) C1515-01MS C1515-01MSD	96 71	(30% RPD)	12/26/96 12/26/96

Result

6

000%

Analysis Date

12/26/96



Client: Stone & Webster Engineering Corp.

Client ID: 1SW 2X Lab ID: C1515-01

Analysis Method: 7470 (Mercury)

6010A (Others)

Matrix: Aqueous

Concentration in: mg/L

Analysis Date: 12/30/96

		Reporting	
<u>Analyte</u>	Results *	<u>Limit</u>	<u>IDL</u>
Antimony	ND	0.05	0.003
Arsenic	ND	0.01	0.002
Beryllium	ND	0.001	0.0002
Cadmium	ND	0.002	0.0002
Chromium	ND	0.01	0.0003
Copper	ND	0.005	0.001
Lead	ND	0.005	0.001
Mercury	ND	0.0005	0.00009
Nickel	ND	0.005	0.5
Selenium	ND	0.02	0.005
Silver	ND	0.01	0.002
Thallium	ND	0.01	0.003
Zinc	ND	0.02	0.001

ND = Not detected

^{*} Reported to Instrument Detection Limit



Client: Stone & Webster Engineering Corp.

Client ID: 1SW 2X Duplicate

Lab ID: C1515-01D

Analysis Method: 7470 (Mercury)

6010A (Others)

Matrix: Aqueous

Concentration in: mg/L

Analysis Date: 12/30/96

		Reporting	
<u>Analyte</u>	Results *	<u>Limit</u>	<u>IDL</u>
Antimony	ND	0.05	0.003
Arsenic	ND	0.01	0.002
Beryllium	ND	0.001	0.0002
Cadmium	ND	0.002	0.0002
Chromium	ND	0.01	0.0003
Copper	ND	0.005	0.001
Lead	ND	0.005	0.001
Mercury	ND	0.0005	0.00009
Nickel	ND	0.005	0.5
Selenium	ND	0.02	0.005
Silver	ND	0.01	0.002
Thallium	ND	0.01	0.003
Zinc	ND	0.02	0.001

ND = Not detected

^{*} Reported to Instrument Detection Limit



Client: Stone & Webster Engineering Corp.

Client ID: 1SW 2X Spike

Lab ID: C1515-01S

Analysis Method: 7470 (Mercury)

6010A (Others)

Matrix: Aqueous

Analysis Date: 12/30/96

Analyte	% Recovery
Antimony	103
•	
Arsenic	109
Beryllium	110
Cadmium	102
Chromium	111
Copper	120
Lead	101
Mercury	110
Nickel	110
Selenium	102
Silver	96
Thallium	95
Zinc	114



Client: Stone & Webster Engineering Corp.

Client ID: 1SW 2D

Lab ID: C1515-02

Analysis Method: 7470 (Mercury)

6010A (Others)

Matrix: Aqueous

Concentration in: mg/L

Analysis Date: 12/30/96

		Reporting	
<u>Analyte</u>	Results *	<u>Limit</u>	<u>IDL</u>
Antimony	0.004 <i>V</i>	0.05	0.003
Arsenic	ND	0.01	0.002
Beryllium	ND	0.001	0.0002
Cadmium	ND	0.002	0.0002
Chromium	ND	0.01	0.0003
Copper	0.006 <i>U</i>	0.005	0.001
Lead	ND	0.005	0.001
Mercury	ND	0.0005	0.00009
Nickel	ND	0.005	0.5
Selenium	ND	0.02	0.005
Silver	ND	0.01	0.002
Thallium	ND	0.01	0.003
Zinc	ND	0.02	0.001

ND = Not detected

^{*} Reported to Instrument Detection Limit



Client: Stone & Webster Engineering Corp.

Client ID: 1SW 1X Lab ID: C1515-03

Analysis Method: 7470 (Mercury)

6010A (Others)

Matrix: Aqueous

Concentration in: mg/L Analysis Date: 12/30/96

		Reporting	
<u>Analyte</u>	Results *	<u>Limit</u>	<u>IDL</u>
Antimony	ND	0.05	0.003
Arsenic	ND	0.01	0.002
Beryllium	ND	0.001	0.0002
Cadmium	ND	0.002	0.0002
Chromium	ND	0.01	0.0003
Copper	0.01 <i>U</i>	0.005	0.001
Lead	0.01	0.005	0.001
Mercury	ND	0.0005	0.00009
Nickel	ND	0.005	0.5
Selenium	ND	0.02	0.005
Silver	ND	0.01	0.002
Thallium	ND	0.01	0.003
Zinc	0.16	0.02	0.001

ND = Not detected

^{*} Reported to Instrument Detection Limit



Client: Stone & Webster Engineering Corp.

Client ID:

Lab ID: Prep Blank, 1219PBW

Analysis Method: 7470 (Mercury)

6010A (Others)

Matrix: Aqueous

Concentration in: mg/L

Analysis Date: 12/30/96

		Reporting	
Analyte	Results *	<u>Limit</u>	<u>IDL</u>
Antimony	0.003	0.05	0.003
Arsenic	ND	0.01	0.002
Beryllium	ND	0.001	0.0002
Cadmium	ND	0.002	0.0002
Chromium	ND	0.01	0.0003
Copper	0.005	0.005	0.001
Lead	ND	0.005	0.001
Mercury	ND	0.0005	0.00009
Nickel	ND	0.005	0.5
Selenium	ND	0.02	0.005
Silver	ND	0.01	0.002
Thallium	ND	0.01	0.003
Zinc	ND	0.02	0.001

ND = Not detected

^{*} Reported to Instrument Detection Limit



Client: Stone & Webster Engineering Corporation

Client ID:

Lab ID: Lab Control Sample, 1219LCSW

Analysis Method: 7470 (Mercury) 6010A (Others)

Matrix: Aqueous

Analysis Date: 12/30/96

Analyte	% Recovery
Aluminum	99
Antimony	99
Arsenic	99
Beryllium	102
Cadmium	100
Chromium	101
Copper	101
Lead	97
Mercury	101
Nickel	98
Silver	99
Zinc	93
	104



Client: Stone & Webster Engineering Corp.

Client ID: 1 SW2X Spike Duplicate

Lab ID: C1515-01SD

Analysis Method: 7470A (Mercury)

6010A (Others)

Matrix: Aqueous

Concentration in: mg/L

Analysis Date: 1/17/97

<u>Analyte</u>	% Recovery
Antimony	117
Arsenic	118
Beryllium	122
Cadmium	112
Chromium	121
Copper	134
Lead	112
Мегсигу	95
Nickel	120
Selenium	113
Silver	114
Thallium	102
Zinc	127

QC Batch: 0115PBW



Client: Stone & Webster Engineering Corp.

Client ID:

Lab ID: Method Blank, 0115PBW Analysis Method: 7470A (Mercury)

6010A (Others)

Matrix: Aqueous

Concentration in: mg/L Analysis Date: 1/17/97

(Mercury) Analysis Date: 1/17/8

		Reporting	
<u>Analyte</u>	Results *	<u>Limit</u>	<u>IDL</u>
Antimony	0.003	0.05	0.003
Arsenic	ND	0.01	0.002
Beryllium	ND	0.001	0.0002
Cadmium	ND	0.002	0.0003
Chromium	ND	0.01	0.0003
Copper	0.01	0.005	0.001
Lead	ND	0.005	0.001
Mercury	ND	0.0005	0.00009
Nickel	ND	0.005	0.001
Selenium	ND	0.02	0.005
Silver	ND	0.01	0.002
Thallium	ND	0.01	0.003
Zinc	0.01	0.02	0.001

ND = Not detected

QC Batch: 0115PBW

^{*} Reported to Instrument Detection Limit



Client: Stone & Webster Engineering Corp.

Client ID: Matrix: Aqueous

Lab ID: Lab Control Sample, 0115LCSW Analysis Date: 1/17/97

Analysis Method: 7470A (Mercury) 6010A (Others)

<u>Analyte</u>	% Recovery
Antimony	106
Arsenic	101
Beryllium	100
Cadmium	105
Chromium	102
Copper	102
Lead	103
Mercury	107
Nickel	103
Selenium	101
Silver	105
Thallium	95
Zinc	107

QC Batch: 0115PBW



Analysis Report: Volatile Organic Compounds

Client: Stone & Webster Engineering Corp.

Client ID: 1SW 2X Lab ID: C1515-01

Analysis: Method 8260A

Analysis Date: 12/26/96

Matrix: Aqueous Concentration in: ug/L

Dilution: 1

<u>Analyte</u>	<u>Results</u>	Reporting <u>Limits</u>
Dichlorodifluoromethane	ND	5
Chloromethane	ND	5
Vinyl chloride	ND	5
Bromomethane	ND	5
Chloroethane	ND	5
Trichlorofluoromethane	ND	5
1,1-Dichloroethene	ND	5
Carbon disulfide	19 ゴ	5
Iodomethane	ND	5
Acetone	6 ゴ	5
Methylene chloride	ND	5
trans-1,2-Dichloroethene	ND	5
1,1-Dichloroethane	ND	5
Vinyl acetate	ND	5
2,2-Dichloropropane	ND	5
cis-1,2-Dichloroethene	ND	5
Methyl ethyl ketone	ND	5
Bromochloromethane	ND	5
Chloroform	ND	5
1,1,1-Trichloroethane	ND	5
Carbon tetrachloride	ND	5
1,1-Dichloropropene	ND	5
Benzene	ND	5
1,2-Dichloroethane	ND	5
Trichloroethene	ND	5
1,2-Dichloropropane	ND	5
Dibromomethane	ND	5
Bromodichloromethane	ND	5
2-Chloroethyl vinyl ether	ND	5
cis-1,3-Dichloropropene	ND	5
4-Methyl-2-pentanone	ND	5
Toluene	19	5



Client ID: 1SW 2X Lab ID: C1515-01

<u>Analyte</u>	<u>Results</u>	Reporting <u>Limits</u>
trans-1,3-Dichloropropene	ND	5
1,1,2-Trichloroethane	ND	5
Tetrachloroethene	ND	5
1,3-Dichloropropane	ND	5
2-Hexanone	ND	5
Dibromochloromethane	ND	5
1,2-Dibromoethane (EDB)	ND	5
Chlorobenzene	ND	5
1,1,1,2-Tetrachloroethane	ND	5
Ethylbenzene	ND	5
Xylenes, total	ND	5
Styrene	ND	5
Bromoform	ND	5
Isopropylbenzene	ND	5
Bromobenzene	ND	5
1,1,2,2-Tetrachloroethane	ND	5
1,2,3-Trichloropropane	ND	5
n-Propylbenzene	ND	5
2-Chlorotoluene	ND	5
4-Chlorotoluene	ND	5
1,3,5-Trimethylbenzene	ND	5
tert-Butylbenzene	ND	5
1,2,4-Trimethylbenzene	ND	5
sec-Butylbenzene	ND	5
1,3-Dichlorobenzene	ND	5
4-Isopropyltoluene	ND	5
1,4-Dichlorobenzene	ND	5
1,2-Dichlorobenzene	ND	5
n-Butylbenzene	ND	5
1,2-Dibromo-3-chloropropane	ND	5
1,2,4-Trichlorobenzene	ND	5
Hexachlorobutadiene	ND	5
1,2,3-Trichlorobenzene MTBE	ND	5 5
IVITOE	ND	5

QC Batch: V1B1226A

Surrogate Recovery:

1.2-Dichloroethane-d497%Toluene-d8105%Bromofluorobenzene104%

ND = Not detected



Analysis Report: Tentatively Identified Compounds (TIC)

Lab ID: C1515-01

Client ID: 1SW 2X

Analysis: Method 8260A

	Retention		Estimated
<u>No.:</u>	Time (Min.)	Compounds	Conc. (ug/L)
1	9.59	Hydrocarbon	5
2	16.44	Hydrocarbon	6
3	17.21	Hydrocarbon	6

Page 1 of 1 C1515-TIC



Analysis Report: Volatile Organic Compounds

Client: Stone & Webster Engineering Corp.

Client ID: 1SW 2D Lab ID: C1515-02

Analysis: Method 8260A

Analysis Date: 12/26/96

Matrix: Aqueous Concentration in: ug/L

Dilution: 1

		Reporting
<u>Analyte</u>	Results	<u>Limits</u>
Dichlorodifluoromethane	ND	5
Chloromethane	ND	5
Vinyl chloride	ND	5
Bromomethane	ND	5
Chloroethane	ND	5
Trichlorofluoromethane	ND	5
1,1-Dichloroethene	ND	5
Carbon disulfide	ע שע	5
Iodomethane	ND	5
Acetone	LU THE	5
Methylene chloride	ND	5
trans-1,2-Dichloroethene	ND	5
1,1-Dichloroethane	ND	5
Vinyl acetate	ND	5
2,2-Dichloropropane	ND	5
cis-1,2-Dichloroethene	. ND	5
Methyl ethyl ketone	ND	5
Bromochloromethane	ND	5
Chloroform	ND	5
1,1,1-Trichloroethane	ND	5
Carbon tetrachloride	ND	5
1,1-Dichloropropene	ND	5
Benzene	ND	5
1,2-Dichloroethane	ND	. 5
Trichloroethene	ND	5
1,2-Dichloropropane	ND	5
Dibromomethane	ND	5
Bromodichloromethane	ND	5
2-Chloroethyl vinyl ether	, ND	5
cis-1,3-Dichloropropene	ND	5
4-Methyl-2-pentanone	ND	5
Toluene	16	5



Client ID: 1SW 2D Lab ID: C1515-02

		Reporting
<u>Analyte</u>	<u>Results</u>	<u>Limits</u>
trans-1,3-Dichloropropene	ND	5
1,1,2-Trichloroethane	ND	5
Tetrachloroethene	ND	5
1,3-Dichloropropane	ND	5
2-Hexanone	ND	5
Dibromochloromethane	ND	5
1,2-Dibromoethane (EDB)	ND	5
Chlorobenzene	ND	5
1,1,1,2-Tetrachloroethane	ND	5
Ethylbenzene	ND	5
Xylenes, total	ND	5
Styrene	ND	5
Bromoform	ND	5
Isopropylbenzene	ND	5
Bromobenzene	ND	5
1,1,2,2-Tetrachloroethane	ND	5
1,2,3-Trichloropropane	ND	5
n-Propylbenzene	ND	5
2-Chlorotoluene	ND	5
4-Chlorotoluene	ND	5
1,3,5-Trimethylbenzene	ND	5
tert-Butylbenzene	ND	5
1,2,4-Trimethylbenzene	ND	5
sec-Butylbenzene	ND	5
1,3-Dichlorobenzene	ND	5
4-Isopropyltoluene	ND	5
1,4-Dichlorobenzene	ND	5
1,2-Dichlorobenzene	ND	5
n-Butylbenzene	ND	5
1,2-Dibromo-3-chloropropane	ND	5
1,2,4-Trichlorobenzene	ND	5
Hexachlorobutadiene	ND	5
1,2,3-Trichlorobenzene	ND	5
MTBE	ND	5
		QC Batch: V
Surrogate Recovery:		

V1B1226A

Surrogate Recovery: 1,2-Dichloroethane-d4 99% Toluene-d8 104% Bromofluorobenzene 105%

ND = Not detected

0016



Analysis Report: Tentatively Identified Compounds (TIC)

Lab ID: C1515-02

Analysis: Method 8260A

Client ID: 1SW 2D

<u>No.:</u>

Retention

Time (Min.) Compounds

Estimated Conc. (ug/L)

None



Analysis Report: Volatile Organic Compounds

Client: Stone & Webster Engineering Corp.

Client ID: 1SW 1X Lab ID: C1515-03

Analysis: Method 8260A

Analysis Date: 12/26/96

Matrix: Aqueous
Concentration in: ug/L

Dilution: 1

Analyte	Results	Reporting <u>Limits</u>
Dichlorodifluoromethane	NID	r
Chloromethane	ND ND	5 5
		_
Vinyl chloride	ND	5
Bromomethane Chloroethane	ND ND	5
		5
Trichlorofluoromethane	ND	5
1,1-Dichloroethene	ND	5
Carbon disulfide	ND	5
lodomethane	ND	5
Acetone	ND	5
Methylene chloride	ND	5
trans-1,2-Dichloroethene	ND	5
1,1-Dichloroethane	ND	5
Vinyl acetate	ND	5
2,2-Dichloropropane	ND	5
cis-1,2-Dichloroethene	ND	5
Methyl ethyl ketone	ND	5
Bromochloromethane	ND	5
Chloroform	ND	5
1,1,1-Trichloroethane	ND	5
Carbon tetrachloride	ND	5
1,1-Dichloropropene	ND	5
Benzene	ND	5
1,2-Dichloroethane	ND	5
Trichloroethene	ND	5
1,2-Dichloropropane	ND	5
Dibromomethane	ND	5
Bromodichloromethane	ND	5
2-Chloroethyl vinyl ether	ND	5
cis-1,3-Dichloropropene	ND	5
4-Methyl-2-pentanone	ND	5
Toluene	ND	5



Client ID: 1SW 1X

Lab ID: C1515-03

		Reporting
<u>Analyte</u>	<u>Results</u>	Limits
trans-1,3-Dichloropropene	ND	5
1,1,2-Trichloroethane	ND	5
Tetrachloroethene	ND	5
1,3-Dichloropropane	ND	5
2-Hexanone	ND	5
Dibromochloromethane	ND	5
1,2-Dibromoethane (EDB)	ND	5
Chlorobenzene	ND	5
1,1,1,2-Tetrachloroethane	ND	5
Ethylbenzene	ND	5
Xylenes, total	ND	5
Styrene	ND	5
Bromoform	ND	5
Isopropylbenzene	ND	5
Bromobenzene	ND	5
1,1,2,2-Tetrachloroethane	ND	5
1,2,3-Trichloropropane	ND	5
n-Propylbenzene	ND	5
2-Chlorotoluene	ND	5
4-Chlorotoluene	ND	5
1,3,5-Trimethylbenzene	ND	5
tert-Butylbenzene	ND	5
1,2,4-Trimethylbenzene	ND	5
sec-Butylbenzene	ND	5
1,3-Dichlorobenzene	ND	5
4-Isopropyltoluene	ND	5
1,4-Dichlorobenzene	ND	5
1,2-Dichlorobenzene	ND	5
n-Butylbenzene	ND	5
1,2-Dibromo-3-chloropropane	ND	5
1,2,4-Trichlorobenzene	ND	5
Hexachlorobutadiene	ND	5
1,2,3-Trichlorobenzene	ND	5
MTBE	ND	5
		QC Batch: V1B1226A
Surrogate Recovery:		
1,2-Dichloroethane-d4	98%	
Toluene-d8	104%	
Bromofluorobenzene	104%	

ND = Not detected



Analysis Report: Tentatively Identified Compounds (TIC)

Lab ID: C1515-03 Client ID: 1SW 1X

Analysis: Method 8260A

<u>No.:</u>	Retention Time (Min.)	Compounds	Estimated Conc. (ug/L)
1	15.28	C4-Benzene	7
2	15.67	Unknown hydrocarbon	20
3	16.44	Aliphatic hydrocarbon	28
4	16.56	Unknown hydrocarbon	15
5	17.21	Aliphatic hydrocarbon	35



Analysis Report: Volatile Organic Compounds

Client: Stone & Webster Engineering Corp. Analysis Date: 12/26/96

Client ID: Trip Blank
Lab ID: C1515-05

Matrix: Aqueous
Concentration in: ug/L

Analysis: Method 8260A Dilution: 1

		Reporting
Analyte	<u>Results</u>	<u>Limits</u>
Dichlorodifluoromethane	ND	5
Chloromethane	ND	5
Vinyl chloride	ND	5
Bromomethane	ND	5
Chloroethane	ND	5
Trichlorofluoromethane	ND	5
1,1-Dichloroethene	ND	5
Carbon disulfide	ND	5
Iodomethane	ND	5
Acetone	ND	5
Methylene chloride	ND	5
trans-1,2-Dichloroethene	ND	5
1,1-Dichloroethane	ND	5
Vinyl acetate	ND	5
2,2-Dichloropropane	ND	5
cis-1,2-Dichloroethene	ND	5
Methyl ethyl ketone	ND	5
Bromochloromethane	ND	5
Chloroform	ND	5
1,1,1-Trichloroethane	ND	5
Carbon tetrachloride	ND	5
1,1-Dichloropropene	ND	5
Benzene	ND	5
1,2-Dichloroethane	ND	5
Trichloroethene	ND	5
1,2-Dichloropropane	ND	5
Dibromomethane	ND	5
Bromodichloromethane	ND	5
2-Chloroethyl vinyl ether	ND	5
cis-1,3-Dichloropropene	ND	5
4-Methyl-2-pentanone	ND	5
Toluene	ND	5



Client ID: Trip Blank

Lab ID: C1515-05

Analyte	Results	Reporting Limits
	11004110	Livino
trans-1,3-Dichloropropene	ND	5
1,1,2-Trichloroethane	ND	5
Tetrachloroethene	ND	5
1,3-Dichloropropane	ND	5
2-Hexanone	ND	5
Dibromochloromethane	ND	5
1,2-Dibromoethane (EDB)	ND	5
Chlorobenzene	ND	5
1,1,1,2-Tetrachloroethane	ND	5
Ethylbenzene	ND	5
Xylenes, total	ND	5
Styrene	ND	5
Bromoform	ND	5
Isopropylbenzene	ND	5
Bromobenzene	ND	5
1,1,2,2-Tetrachloroethane	ND	5
1,2,3-Trichloropropane	ND	5
n-Propylbenzene	ND	5
2-Chlorotoluene	ND	5
4-Chlorotoluene	ND	5
1,3,5-Trimethylbenzene	ND	5
tert-Butylbenzene	ND	5
1,2,4-Trimethylbenzene	ND	5
sec-Butylbenzene	ND	5
1,3-Dichlorobenzene	ND	5
4-Isopropyltoluene	ND	5
1,4-Dichlorobenzene	ND	5
1,2-Dichlorobenzene	ND	5
n-Butylbenzene	ND	5
1,2-Dibromo-3-chloropropane	ND	5
1,2,4-Trichlorobenzene	ND	5
Hexachlorobutadiene	ND	5
1,2,3-Trichlorobenzene	ND	5
MTBE	ND	5
		OC Par

QC Batch: V1B1226A

Surrogate Recovery:

1,2-Dichloroethane-d499%Toluene-d8105%Bromofluorobenzene104%

ND = Not detected



Analysis Report: Tentatively Identified Compounds (TIC)

Page 1 of 1

Lab ID: C1515-05

<u>No.:</u>

Analysis: Method 8260A

Client ID: Trip Blank

Retention

Time (Min.)

Compounds

Estimated Conc. (ug/L)

None



Analysis Report: Volatile Organic Compounds

Client: Stone & Webster Engineering Corp.

Client ID:

Lab ID: Method Blank, V1B1226A

Analysis: Method 8260A

Analysis Date: 12/26/96

Matrix: Aqueous Concentration in: ug/L

Dilution: 1

Analyte	<u>Results</u>	Reporting <u>Limits</u>
Dichlorodifluoromethane	ND	5
Chloromethane	ND	5
Vinyl chloride	ND	5
Bromomethane	ND	5
Chloroethane	ND	5
Trichlorofluoromethane	ND	5
1,1-Dichloroethene	ND	5
Carbon disulfide	ND	5
lodomethane	ND	5
Acetone	ND	5
Methylene chloride	ND	5
trans-1,2-Dichloroethene	ND	5
1,1-Dichloroethane	ND	5
Vinyl acetate	ND	5
2,2-Dichloropropane	ND	5
cis-1,2-Dichloroethene	ND	5
Methyl ethyl ketone	ND	5
Bromochloromethane	ND	5
Chloroform	ND	5
1,1,1-Trichloroethane	ND	5
Carbon tetrachloride	ND	5
1,1-Dichloropropene	ND	5
Benzene	ND	5
1,2-Dichloroethane	ND	5
Trichloroethene	ND	5
1,2-Dichloropropane	ND	5
Dibromomethane	ND	5
Bromodichloromethane	ND	5
2-Chloroethyl vinyl ether	ND	5
cis-1,3-Dichloropropene	ND	5
4-Methyl-2-pentanone	ND	5
Toluene	ND	5



Client ID:

Lab ID: Method Blank, V1B1226A

<u>Analyte</u>	Results	Reporting <u>Limits</u>
trans-1,3-Dichloropropene	ND	5
1,1,2-Trichloroethane	ND	5
Tetrachloroethene	ND	5
1,3-Dichloropropane	ND	5
2-Hexanone	ND	5
Dibromochloromethane	ND	5
1,2-Dibromoethane (EDB)	ND	5
Chlorobenzene	ND	5
1,1,1,2-Tetrachloroethane	ND	5
Ethylbenzene	ND	5
Xylenes, total	ND	5
Styrene	ND	5
Bromoform	ND	5
Isopropylbenzene	ND	5
Bromobenzene	ND	5
1,1,2,2-Tetrachloroethane	ND	5
1,2,3-Trichloropropane	ND	5
n-Propylbenzene	ND	5
2-Chlorotoluene	ND	5
4-Chlorotoluene	ND	5
1,3,5-Trimethylbenzene	ND	5
tert-Butylbenzene	ND	5
1,2,4-Trimethylbenzene	ND	5
sec-Butylbenzene	ND	5
1,3-Dichlorobenzene	ND	5
4-Isopropyltoluene	ND	5
1,4-Dichlorobenzene	ND	5
1,2-Dichlorobenzene	ND	5
n-Butylbenzene	ND	5
1,2-Dibromo-3-chloropropane	ND	5
1,2,4-Trichlorobenzene	ND	5
Hexachlorobutadiene	ND	5
1,2,3-Trichlorobenzene	ND	5
MTBE	ND	5
		QC Batch: V1B1226A
Surrogate Recovery:	000/	
1,2-Dichloroethane-d4	99%	
Toluene-d8	105%	
Bromofluorobenzene	103%	

ND = Not detected



Analysis Report: Tentatively Identified Compounds (TIC)

Lab ID: Method Blank, V1B1226A

Analysis: Method 8260A

Client ID:

Retention

No.: Time (Min.)

Compounds

Estimated Conc. (ug/L)

None



Analysis Report: Volatile Organic Compounds

Matrix Spike Summary

Client: Stone & Webster Engineering Corp.

Client ID: 1SW 2X

Lab ID for Matrix Spike: C1515-01MS

Lab ID for Matrix Spike Duplicate: C1515-01MSD

Analysis: Method 8260A

Matrix: Aqueous

Analysis Date for Matrix Spike: 12/26/96

Analysis Date for Matrix Spike Duplicate: 12/26/96

% Recovery

<u>Analyte</u>	Matrix Spike	Matrix Spike Dup.	% RPD
1,1-Dichloroethene	97	96	1
Benzene	103	104	1
Trichloroethene	102	104	2
Toluene	97	100	3
Chlorobenzene	100	102	2

QC Batch: V1B1226A



Analysis Report: Volatile Organic Compounds

Client: Stone & Webster Engineering Corp.

Client ID:

Lab ID: Lab Control Sample, V1L1226A

Analysis: Method 8260A

Analysis Date: 12/26/95
Matrix: Aqueous

Analyle	<u>% Recovery</u>
Dichlorodifluoromethane	NS
Chloromethane	75
Vinyl chloride	76
Bromomethane	83
Chloroethane	107
Trichlorofluoromethane	NS
1,1-Dichlaroethene	107
Carbon disulfide	166
lodomethane	NS
Acetone	212
Methylene chloride	106
trans-1,2-Dichloroethene	113
1,1-Dichloroethane	113
Vinyl acetate	NS
2,2-Dichloropropane	NS
cis-1,2-Dichloroethene	114
Methyl ethyl ketone	207
Bromochloromethane	NS
Chloroform	113
1,1.1-Trichloroethane	111
Carbon tetrachloride	115
1,1-Dichforopropene	NS
Benzene	111
1,2-Dichloroethane	115
Trichloroethene	111
1,2-Dichloropropane	111
Dibromomethane	NS
Bromodichloromethane	115
2-Chloroethyl vinyl ether	NS
cis-1,3-Dichlaropropene	113
4-Methyl-2-pentanone	125
Toluene	109



Client ID:

Lab ID: Lab Control Sample. V1L1226A

Analyte	% Recovery
trans-1,3-Dichloropropene	114
1,1,2-Trichloroethane	115
Tetrachloroethene	114
1,3-Dichloropropane	NS
2-Hexanone	169
Dibromochloromethane	117
1,2-Dibromoethane (EDB)	NS
Chlorobenzene	108
1,1,1,2-Tetrachloroethane	NS
Ethylbenzene	111
Xylenes, total	110
Styrene	112
Bromoform	116
Isopropylbenzene	NS
Bromobenzene	NS
1,1,2,2-Tetrachloroethane	114
1,2,3-Trichloropropane	NS
n-Propylbenzene	NS
2-Chlorotoluene	NS
4-Chlorotoluene	NS
1,3,5-Trimethylbenzene	NS
tert-Butylbenzene	NS
1,2,4-Trimethylbenzene	NS
sec-Butylbenzene	· NS
1,3-Dichlorobenzene	NS
4-isopropyitoluene	NS
1,4-Dichlorobenzene	NS
1,2-Dichlorobenzene	NŞ
n-Butylbenzene	NS
1,2-Dibromo-3-chloropropane	NS
1,2,4-Trichlorobenzene	NS
Hexachlorobutadiene	NS
1,2,3-Trichlorobenzene	NS
МТВЕ	NS

QC Batch: V1B1226A

NS = Not Spike

BFB

Data File : C:\HPCHEM\1\DATA\DEC2695\V1A7610.D

Acq On : 26 Dec 96 10:03 am

Sample : 8260/ V1T1226A/ 50 NG BFB

Misc : 2 **DL VW960823D**

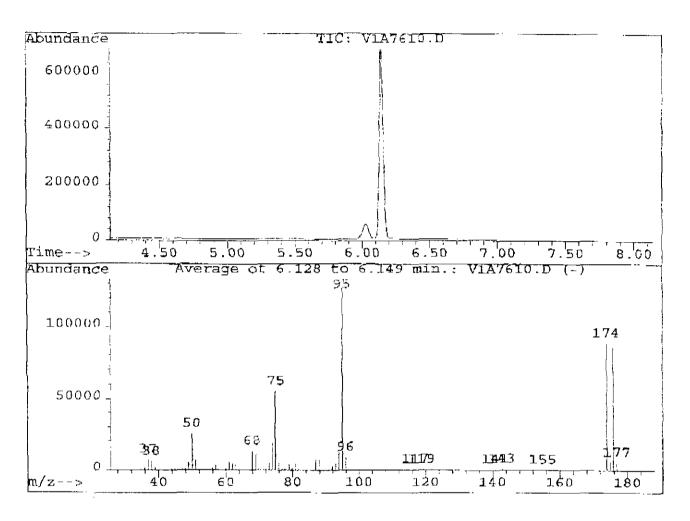
Operator: CPS Inst : V1

Multiplr: 1.00

Vial: 100

Method : C:\HPCHEM\1\METHODS\V18260.M

Title : Method 8260 - Water and Medium Soil



Peak Apex is scan: 300

	Target Mass	Rel. to	Lower Limit*	Upper Limit%	Rel. Abn%	Raw Abn	Result Pass/Fail
Ì	50	95	15	40	20.0	25400	l Pass
İ	75	95	30	60	43.6	55298	PASS
i	95	95	100	100	100.0	126968	PASS
į	96	95	5	و	6.9	8711	PASS
1	173	174	0	2	0.0	0	PASS
1	174	95	50	100	69.9	88784	PASS
1	175	1.74	5	9	7.5	6750	PASS
ł	176	174	95	101	97.0	86160	PASS
	177	176	5	9	6.4	5525	PASS

Average of 6.128 to 6.149 min.: V1A7610.D

Modified:su	ubtracted	scaled					
m/2	abund.	m/z	abund.	m/z	abund.	m/z	abund.
36.05	1	49.05	4	63.05	3	77.05	-
37.05	€	50. 0 5	20	64.00	0	78.00	0
38.00	5	51.05	6	€7.05	0	78.95	3
39.05	2	52.10	0	68.05	11	79.95	l
40.05	0	55.05	Q	69.05	10	80 .95	3
43.05	0	56.05	2	70.05	1	81.90	1
44.05	J.	57.05	3	72.05	1	82.85	0
45.05	1	58.00	0	73.05	4	83.05	0
46.10	0	60.05	1	74.05	15	85.95	0
47.10	2	61.05	4	75.05	44	86.95	6
48.05	1	62.05	4	76.05	4	87.95	5
Average of	6.128 to	6.149 min.	: VLA7610	.D			
Modified:st	ubtracted	scaled					
m/z	abund.	m/z	abund.	m/z	abund.	m/z	abund.
90.95	0	110.95	0	129.85	Q	152.90	0
91.95	2	111.85	Q	130.85	0	154.95	0
93.05	4	112.90	0	134.85	0	157.00	0
94.00	11	114.95	0	136.85	٥	158.90	0
95.05	100	115.90	0	140.85	1	173.90	70
96.00	7	116.90	1	141.80	0	175.00	5
97.05	9	117.90	Ò	142.85	1	1 75. 90	68
1 03.95	G	118.90	0	144.85	0	176.90	4
104.90	C	123.95	Đ	145.85	0	177.90	0
105.85	C	127.85	0	147.90	Ö		

106.90 0 128.85 0 149.85 0



Analysis Report. Volatile Organic Compounds

Matrix Spike Summary

Client: Stone & Webster Engineering Corp.

Client ID: 1SW 2X

Lab ID for Matrix Spike: C1515-01MS

Lab ID for Matrix Spike Duplicate: C1515-01MSD

Analysis: Method 8260A

Matrix: Aqueous

Analysis Date for Matrix Spike: 12/26/96

Analysis Date for Matrix Spike Duplicate: 12/26/96

% Recovery

<u>Analyte</u>	Matrix Spike	Matrix Spike Dup.	% RPD	
1.1-Dichloroethene	97	96	1	
Benzene	193	104	1	
Trichloroethene	102	104	2	
Toluene	97	100	3	
Chlorobenzene	100	102	2	
Surrogate Recovery				
1,2 -Dichloroethane-d4	103	102	1	
Toluene-d8	105	105	ō	
4-Bromofluorobenzene	102	104	2	

QC Batch: V1B1226A



Client: Stone & Webster Engineering Corp.

Analysis: MADEP EPH Draft 1.0

Date Collected: 12/12/96 Client ID: 1SW 2X Date Received: 12/13/96 Lab ID: C1515-01 Date Extracted: 12/17/96

Matrix: Aqueous Date Analyzed: 12/20/96 & 12/28/96

Concentration in: ug/L Date Reported: 1/2/97

Dilution: 1

		Reporting
<u>EPH</u>	Results	<u>Limits</u>
C9 - C18 Aliphatics	2,100	30
C19 - C36 Aliphatics	350 J	40
C10 - C22 Aromatics	920	85
Total EPH *	1,000	
Taract Analytes		
Target Analytes Acenaphthene	ND	5
Acenaphthylene	ND ND	5
Anthracene	ND ND	5
Benzo(a)anthracene	ND ND	5
Benzo(a)pyrene	ND ND	5
	ND	5
Benzo(b)fluoranthene	ND ND	5
Benzo(ghi)perylene	ND ND	5
Benzo(k)fluoranthene	ND ND	5
Chrysene		5
Dibenzo(a,h)anthracene	ND	5
Fluoranthene	ND	
Fluorene	ND	5
Indeno(1,2,3-cd)pyrene	ND	5
Naphthalene	ND	5
Phenanthrene -	ND	5
Pyrene	ND	5
2-Methylnaphthalene	ND	5
Surrogate Recovery:		
Chlorooctadecane	96%	
o-Terphenyl	95%	
2		

ND= Not detected

^{*} Total EPH = 0.05* C9 - C18 Aliphatics + 0.005* C19 - C36 Aliphatics + 1.0* C10 - C22 Aromatics



Client: Stone & Webster Engineering Corp.

Analysis: MADEP EPH Draft 1.0

Client ID: 1SW 2D Lab ID: C1515-02

Matrix: Aqueous

Concentration in: ug/L

Date Collected: 12/12/96 Date Received: 12/13/96 Date Extracted: 12/17/96

Date Analyzed: 12/20/96 & 12/28/96

Date Reported: 1/2/97

Dilution: 1

		Reporting
<u>EPH</u>	<u>Results</u>	<u>Limits</u>
C9 - C18 Aliphatics	2,100	30
C19 - C36 Aliphatics	360	40
C10 - C22 Aromatics	1,000	85
Total EPH *	1,200	
Target Analytes		
Acenaphthene	ND	5
Acenaphthylene	ND	5
Anthracene	ND	5
Benzo(a)anthracene	ND	5
Benzo(a)pyrene	ND	5
Benzo(b)fluoranthene	ND	5
Benzo(ghi)perylene	ND	5
Benzo(k)fluoranthene	ND	5
Chrysene	ND	5
Dibenzo(a,h)anthracene	ND	5
Fluoranthene	ND	5
Fluorene	ND	5
indeno(1,2,3-cd)pyrene	ND	5
Naphthalene	ND	5
Phenanthrene	ND	5
Pyrene	ND	5
2-Methylnaphthalene	ND	5
Surrogate Recovery:		
Chlorooctadecane	99%	
o-Terphenyl	104%	

ND= Not detected

^{*} Total EPH = 0.05* C9 - C18 Aliphatics + 0.005* C19 - C36 Aliphatics + 1.0* C10 - C22 Aromatics



Client: Stone & Webster Engineering Corp.

Analysis: MADEP EPH Draft 1.0

Client ID: 1SW 1X Lab ID: C1515-03

Matrix: Aqueous

Concentration in: ug/L

Date Collected: 12/12/96 Date Received: 12/13/96

Date Extracted: 12/17/96 Date Analyzed: 12/21/96 & 12/30/96

Date Reported: 1/2/97

Dilution: 10

<u>EPH</u>	<u>Results</u>	Reporting <u>Limits</u>
C9 - C18 Aliphatics	97,000 🕏	300
C19 - C36 Aliphatics	20,000	400
C10 - C22 Aromatics	26,000 ↓	850
Total EPH *	31,000	
Target Analytes		
Acenaphthene	MD (17	50
Acenaphthylene	ND	50
Anthracene	NΦ	50
Benzo(a)anthracene	NP	50
Benzo(a)pyrene	NID	50
Benzo(b)fluoranthene	ND	50
Benzo(ghi)perylene	NP	50
Benzo(k)fluoranthene	ND	50 50
Chrysene	NP	50 50
Dibenzo(a,h)anthracene Fluoranthene		50 50
Fluoranmene		50
Indeno(1,2,3-cd)pyrene		50
Naphthalene	NIP	50
Phenanthrene	, hp	50
Pyrene	ND	50
2-Methylnaphthalene	MB 1	50
Surrogate Recovery:		
Chlorooctadecane	**	
o-Terphenyl	**	

ND= Not detected

^{*} Total EPH = 0.05* C9 - C18 Aliphatics + 0.005* C19 - C36 Aliphatics + 1.0* C10 - C22 Aromatics

^{**} Surrogate recovery could not be determined due to coeluting interferences.



Client: Stone & Webster Engineering Corp.

Analysis: MADEP EPH Draft 1.0

Client ID:

Lab ID: Method Blank, EPH1219-B1

Matrix: Aqueous

Concentration in: ug/L

Date Collected: 12/12/96

Date Received: 12/13/96

Date Extracted: 12/17/96

Date Analyzed: 12/20/96 & 12/28/96

Date Reported: 1/2/97

Dilution: 1

		Reporting
<u>EPH</u>	<u>Results</u>	<u>Limits</u>
C9 - C18 Aliphatics	ND	30
C19 - C36 Aliphatics	ND	40
C10 - C22 Aromatics	ND	85
Total EPH *	ND	
Target Analytes		
Acenaphthene	ND	5
Acenaphthylene	ND	5
Anthracene	ND	5
Benzo(a)anthracene	ND	5
Benzo(a)pyrene	ND	5
Benzo(b)fluoranthene	ND	5
Benzo(għi)perylene	ND	5
Benzo(k)fluoranthene	ND	5
Chrysene	ND	5
Dibenzo(a,h)anthracene	ND	5
Fluoranthene	ND	5
Fluorene	ND	5
Indeno(1,2,3-cd)pyrene	ND	5
Naphthalene	ND	5
Phenanthrene	ND	5
Pyrene	ND	5
2-Methylnaphthalene	ND	5
Surrogate Recovery:		
Chlorooctadecane	106%	
o-Terphenyl	88%	
• •		

ND= Not detected

QC Batch: EPH1217-B1

Page 1 of 1

^{*} Total EPH = 0.05* C9 - C18 Aliphatics + 0.005* C19 - C36 Aliphatics + 1.0* C10 - C22 Aromatics



Analysis Report: Lab Control Summary

Client: Stone & Webster Engineering Corp.

Matrix: Aqueous

Lab ID for Lab Control Sample: EPH1219-LCS1 Date Extracted: 12/17/96

Analysis: MADEP EPH Draft 1.0

MADEP EPH - F1

Date Analyzed: 12/20/96

Analyte	% Recovery
C9 - C18 Aliphatics	62
	83
C19 - C36 Aliphatics	

MADEP EPH - F2

Date Analyzed: 12/28/96

Analyte	% Recovery
Acenaphthene	82
Anthracene	100
Chrysene	87
Naphthalene	78
Pyrene	90
C10 - C22 Aromatics	87



Analysis Report: Matrix Spike Summary

Client Stone & Webster Engineering Corp.

Matrix: Aqueous Client ID: 1SW 2X

Lab ID for Matrix Spike (MS): C1515-01MS

Lab ID for Matrix Spike Duplicate (MSD): C1515-01MSD

Analysis: MADEP EPH Draft 1.0

Date Extracted for MS; 12/17/96 Date Extracted for MSD: 12/17/96

Date Analyzed for MS: 12/20/96 & 12/28/96 Date Analyzed for MSD: 12/20/96 & 12/28/96

MADEP EPH - F1

	% Red	zovery .	
Analyte	<u>MS</u>	MSD	<u>% RPD</u>
C9 - C18 Aliphatics	74	64	14
C19 - C36 Aliphatics	31	31	0

MADEP EPH - F2

Date Analyzed for MS: 12/20/96 & 12/28/96
Date Analyzed for MSD: 12/20/96 & 12/28/96

	% Rec	overy	
Analyte	<u>MS</u>	<u>MSD</u>	% RPD
Acenaphthene	79	88	11
Anthracene	93	98	5
Chrysene	48	50	4
Naphthalene	68	74	8
Pyrene	86	81	6
C10 - C22 Aromatics	75	78	4
Sunogate Recovery:			
Chlorooctadecane	83	88	6
O-Terphenyl	105	104	1



Client: Stone & Webster Engineering Corp.

Analysis: MADEP VPH Draft 1.0

Client ID: 1SW 2X Lab ID: C1515-01 Matrix: Aqueous

Concentration in: ug/L

Date Collected: 12/12/96 Date Received: 12/13/96

Date Analyzed: 12/24/96 Date Reported: 1/2/97

Dilution: 1

<u>VPH</u>	<u>Results</u>	Reporting <u>Limits</u>
C5 - C8 Aliphatics	ND	75
C9 - C12 Aliphatics	190	65
C9 - C10 Aromatics	100 J	20
Total VPH *	110	
Target Analytes		
MTBE	ND	5
Benzene	ND	5
Toluene	15	5
Ethylbenzene	ND	5
m- and p-Xylenes	ND	5
o-Xylene	ND	5
Naphthalene	5	5

ND= Not detected

Surrogate Recovery: 2,5-Dibromotoluene

103%

^{*} Total VPH = 0.5* C5 - C8 Aliphatics + 0.05* C9 - C12 Aliphatics + 1.0* C9 - C10 Aromatics



Client: Stone & Webster Engineering Corp.

Analysis: MADEP VPH Draft 1.0

Client ID: 1SW 2D Lab ID: C1515-02 Matrix: Aqueous

Concentration in: ug/L

Date Collected: 12/12/96

Date Received: 12/13/96

Date Analyzed: 12/24/96

Date Reported: 1/2/97

Dilution: 1

<u>VPH</u>	Results	Reporting <u>Limits</u>
C5 - C8 Aliphatics C9 - C12 Aliphatics C9 - C10 Aromatics	ND 160 130 J	75 65 20
Total VPH *	140	
<u>Target Analytes</u>		
MTBE Benzene Toluene Ethylbenzene m- and p-Xylenes o-Xylene Naphthalene	ND ND 16 ND ND ND ND 5	5 5 5 5 5 5
Surrogate Recovery: 2,5-Dibromotoluene	118%	

ND= Not detected

^{*} Total VPH = 0.5* C5 - C8 Aliphatics + 0.05* C9 - C12 Aliphatics + 1.0* C9 - C10 Aromatics



Client: Stone & Webster Engineering Corp.

Analysis: MADEP VPH Draft 1.0

Client ID: 1SW 1X Lab ID: C1515-03 Matrix: Aqueous

Concentration in: ug/L

Date Collected: 12/12/96

Date Received: 12/13/96 Date Analyzed: 12/24/96

Date Reported: 1/2/97

Dilution: 1

<u>VPH</u>	<u>Results</u>	Reporting <u>Limits</u>
C5 - C8 Aliphatics	ND	75
C9 - C12 Aliphatics	280	65
C9 - C10 Aromatics	160 <i>J</i>	20
Total VPH *	170	
Target Analytes		
MTBE	ND	5
Benzene	ND	5
Toluene	ND	5
Ethylbenzene	ND	5
m- and p-Xylenes	ND	5
o-Xylene ,	ND	5
Naphthalene	6	5

Surrogate Recovery:

2,5-Dibromotoluene

114%

ND= Not detected

* Total VPH = 0.5* C5 - C8 Aliphatics + 0.05* C9 - C12 Aliphatics + 1.0* C9 - C10 Aromatics



Date Collected: 12/12/96

Client: Stone & Webster Engineering Corp.

Analysis: MADEP VPH Draft 1.0

Client ID: Trip Blank

Lab ID: C1515-04

Matrix: Aqueous

Date Received: 12/13/96

Date Analyzed: 12/24/96

Date Reported: 1/2/97

Concentration in: ug/L Dilution; 1

<u>VPH</u>	Results	Reporting <u>Limits</u>
C5 - C8 Aliphatics	ND	75
C9 - C12 Aliphatics	ND	65
C9 - C10 Aromatics	35 J	20
Total VPH *	35	
Target Analytes		
MTBE	ND	5
Benzene	ND	5
Toluene	ND	5
Ethylbenzene	ND	5
m- and p-Xylenes	ND	5
o-Xylene	ND	5
Naphthalene	ND	5

Surrogate Recovery:

2,5-Dibromotoluene 121% *

ND= Not detected

^{*} Total VPH = 0.5* C5 - C8 Aliphatics + 0.05* C9 - C12 Aliphatics + 1.0* C9 - C10 Aromatics

^{*} Outside control limit; alternate surrogate (BFB) recovery is 110%.



Client: Stone & Webster Engineering Corp.

Analysis: MADEP VPH Draft 1.0

Client ID:

Lab ID: Method Blank, V4B1223A

Matrix: Aqueous

Concentration in: ug/L

Date Collected:

Date Received:

Date Analyzed: 12/24/96

Date Reported: 1/2/97

Dilution: 1

		Reporting
<u>VPH</u>	Results	<u>Limits</u>
C5 - C8 Aliphatics	ND	75
C9 - C12 Aliphatics	ND	65
C9 - C10 Aromatics	ND	20
Total VPH *	ND	
Target Analytes		
		_
MTBE	ND	5
Benzene	ND	5
Toluene	ND	5
Ethylbenzene	ND	5
m- and p-Xylenes	ND	5
o-Xylene	ND	5
Naphthalene	ND	5

Surrogate Recovery:

2,5-Dibromotoluene 114%

ND= Not detected

* Total VPH = 0.5* C5 - C8 Aliphatics + 0.05* C9 - C12 Aliphatics + 1.0* C9 - C10 Aromatics



Matrix Spike Summary

Client: Stone & Webster Engineering Corp.

Matrix: Aqueous

Client ID: 1SW 2X

Lab ID for Matrix Spike: C1515-01MS

Lab ID for Matrix Spike Duplicate: C1515-01MSD

Analysis Date for Matrix Spike: 12/24/96

Analysis Date for Matrix Spike Duplicate: 12/24/96

Analysis: MADEP VPH Draft 1.0

Recovery

Analyte	Matrix Spike	Matrix Spike Dup.	% RPD
C5 - C8 Aliphatics	83	96	15
C9 - C12 Aliphatics	102	119	15
C9 - C10 Aromatics	101	119	16
MTBE	93	98	5
Benzene	98	106	8
Toluene	103	112	8
Ethylbenzene	92	102	10
m- and p-Xylenes	96	106	10
o-Xylene	94	104	10
Naphthalene	103	110	7
Surrogates Recoveries;			
Bromofluorobenzene	101	100	1
2,5-Dibromotoluene	121	137	12



Lab Control Summary

Client: Stone & Webster Engineering Corp.

Lab ID: V4L1223A

Analysis: MADEP VPH Draft 1.0

Matrix: Aqueous

Analysis Date for Blank Spike: 12/23/96

<u>Analyte</u>	<u>% Recovery</u>
C5 - C8 Aliphatics	86
C9 - C12 Aliphatics	106
C9 - C10 Aromatics	99
MTBE	95
Benzene	98
Toluene	98
Ethylbenzene	96
m- and p-Xylenes	98
o-Xylene	98
Naphthalene	101

QC Batch: V4B1223A

C1515-LCS 0041



Client: Stone & Webster Engineering Corp.

Client ID: 1SW 2X Lab ID: C1515-01

Analysis: Method 8081

Analysis Date: 12/29/96

Matrix: Aqueous

Concentration in: ug/L

Dilution: 1

gamma-BHC ND 0.05 Heptachlor ND 0.05 Aldrin ND 0.05 beta-BHC ND 0.05 delta-BHC ND 0.05 Heptachlor epoxide ND 0.05 Endosulfan I ND 0.05	Analyte	Results	Reporting <u>Limits</u>
Dieldrin ND 0.7 Endrin ND 0.7 4,4'-DDD ND 0.7 Endosulfan II ND 0.7 4,4'-DDT ND 0.7 Endrin aldehyde ND 0.7 Methoxychlor ND 0.8 Endosulfan sulfate ND 0.9 alpha-Chlordane ND 0.0 gamma-Chlordane ND 0.0 Endrin ketone ND 0.0 Toxaphene ND ND Aroclor-1016 ND ND Aroclor-1221 ND ND Aroclor-1232 ND ND	alpha-BHC gamma-BHC Heptachlor Aldrin beta-BHC delta-BHC Heptachlor epoxide Endosulfan I 4,4'-DDE Dieldrin Endrin 4,4'-DDD Endosulfan II 4,4'-DDT Endrin aldehyde Methoxychlor Endosulfan sulfate alpha-Chlordane gamma-Chlordane Endrin ketone Toxaphene Aroclor-1221 Aroclor-1232	3 	Limits 0.05 0.05 0.05 0.05 0.05 0.05 0.05 0.
Aroclor-1248 ND Aroclor-1254 ND	Aroclor-1248 Aroclor-1254	ND ND	1 1 1 1

QC Batch: P1220-B2

Surrogate Recovery:

2,4,5,6-Tetrachloro-m-xylene 62% Decachlorobiphenyl 78%



Client: Stone & Webster Engineering Corp.

Client ID: 1SW 2D Lab ID: C1515-02

Analysis: Method 8081

Analysis Date: 12/29/96

Matrix: Aqueous Concentration in: ug/L

Dilution: 1

Reporting

Analyta	Results	Reporting
Analyte	Results	Limits
alpha-BHC	ND UJ	0.05
gamma-BHC	(vid)	0.05
Heptachlor	ND	0.05
Aldrin	Mp	0.05
beta-BHC	μΦ	0.05
delta-BHC	ήφ [0.05
Heptachlor epoxide	Np 1	0.05
Endosulfan I	NID	0.05
4,4'-DDE	ND	0.1
Dieldrin	NP	0.1
Endrin	NÞ	0.1
4,4'-DDD	ND	0.1
Endosulfan II	N I D	0.1
4,4'-DDT	ND	0.1
Endrin aldehyde	ND	0.1
Methoxychlor	NP	0.5
Endosulfan sulfate	NP	0.1
alpha-Chlordane	NP	0.05
gamma-Chlordane	NP	0.05
Endrin ketone	NP	0.05
Toxaphene	ND	5
Aroclor-1016	ND	1
Aroclor-1221	NP	2
Aroclor-1232	<u> </u>	1
Aroclor-1242	NP	1
Aroclor-1248	ND /	1
Aroclor-1254	ND	1
Aroclor-1260	ND 4	1

QC Batch: P1220-B2

Surrogate Recovery:

2,4,5,6-Tetrachloro-m-xylene 90% Decachlorobiphenyl 113%



Client: Stone & Webster Engineering Corp.

Client ID: 1SW 1X Lab ID: C1515-03 Analysis: Method 8081 Analysis Date: 12/29/96

Matrix: Aqueous Concentration in: ug/L

Dilution: 1

Analyte	Results	Reporting · <u>Limits</u>
alpha-BHC gamma-BHC	ND NO	0.05 0.05
Heptachlor	NP	0.05
Aldrin beta-BHC	72	0.05 0.05
delta-BHC	0.11 P J	0.05
Heptachlor epoxide	tv dn	0.05
Endosulfan I	NID	0.05
4,4'-DDE	ND	0.1
Dieldrin	ND	0.1
Endrin	ND	0.1
4,4'-DDD	ND	0.1
Endosulfan II	NP	0.1
4,4'-DDT	4P	0.1
Endrin aldehyde	th to 1	0.1
Methoxychlor	ND +	0.5
Endosulfan sulfate	0.13 P J	0.1
alpha-Chlordane	ND VZ	0.05
gamma-Chlordane Endrin ketone	ND	0.05
Toxaphene	NID	0.05 5
Arocior-1016	ND	1
Aroclor-1221	ND	2
Aroclor-1232	ND	1
Aroclor-1242	ND	1
Aroclor-1248	ир	1
Aroclor-1254	ΝÞΙ	1
Aroclor-1260	ИФſ	1

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5
1
2
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1
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1
1

QC Batch: P1220-B2

Surrogate Recovery:

2,4,5,6-Tetrachloro-m-xylene 107% Decachlorobiphenyl 78%



Client: Stone & Webster Engineering Corp.

Client ID:

Lab ID: Method Blank, P1220-B2

Analysis: Method 8081

Analysis Date: 12/29/96

Matrix: Aqueous Concentration in: ug/L

Dilution: 1

Analyte	<u>Results</u>	Reporting <u>Limits</u>
alpha-BHC	ND	0.05
gamma-BHC	ND	0.05
Heptachlor	ND	0.05
Aldrin	ND	0.05
beta-BHC	ND	0.05
delta-BHC	ND	0.05
Heptachlor epoxide	ND	0.05
Endosulfan I	ND	0.05
4,4'-DDE	ND	0.1
Dieldrin	ND	0.1
Endrin	ND	0.1
4,4'-DDD	ND	0.1
Endosulfan II	ND	0.1
4,4'-DDT	ND	0.1
Endrin aldehyde	ИÐ	0.1
Methoxychlor	ND	0.5
Endosulfan sulfate	ND	0.1
alpha-Chlordane	ND	0.05
gamma-Chlordane	ND	0.05
Endrin ketone	ND	0.05
Toxaphene	ND	5
Arocior-1016	ND	1
Aroclor-1221	ND	2
Aroclor-1232	ND	1
Aroclor-1242	ND	1
Aroclor-1248	ND	1
Aroclor-1254	ND	1
Aroclor-1260	ND	1

QC Batch: P1220-B2

Surrogate Recovery:

2,4,5,6-Tetrachloro-m-xylene 78% Decachlorobiphenyl 105%



Matrix Spike Summary

Client: Stone & Webster Engineering Corp.

Client ID: 1SW 2X

Lab ID for Matrix Spike: C1515-01MS

Lab ID for Matrix Spike Duplicate: C1515-01MSD

Analysis: Method 8081

Matrix: Aqueous

Analysis Date for Matrix Spike: 12/29/96

Analysis Date for Matrix Spike Duplicate: 12/29/96

% Recovery

Analyte	Matrix Spike	Matrix Spike Dup.	% RPD
gamma-BHC (Lindane)	87	76	14
Heptachlor	83	86	4
Aldrin	78	70	11
Dieldrin	92	92	0
Endrin	187	198	6
4,4'-DDT	90	102	13
Surrage Recovery:			
2,4,5,6-Tetrachloro-m-xylene	70	85	19
Decachlorobiphenyl	135	111	20

QC Batch: P1220-B2



Client: Stone & Webster Engineering Corp.

Client ID:

Lab ID: Lab Control Sample, P1220-LCS2

Analysis: Method 8081

Analysis Date: 12/29/96

Matrix: Aqueous

Analyte	% Recovery
alpha-BHC	98
gamma-BHC	99
Heptachlor	94
Aldrin	80
beta-BHC	110
delta-BHC	124
Heptachlor epoxide	104
Endosulfan I	99
4,4'-DDE	96
Dieldrin	112
Endrin	215
4,4'-DDD	99
Endosulfan II	133
4,4'-DDT	96
Endrin aldehyde	129
Methoxychlor	122
Endosulfan sulfate	137
alpha-Chlordane	100
gamma-Chlordane	92
Endrin ketone	158
	(

QC Batch: P1220-B2

ata File : c:\hpchem\1\data\dec2696\v1a7624.d

Acq On : 26 Dec 96 4:20 pm Sample : S & W/C1515-01/ 1SW 2X Misc : 5ML+10uL VW961223D Operator: CPS
Inst : V1
Multiplr: 1.00

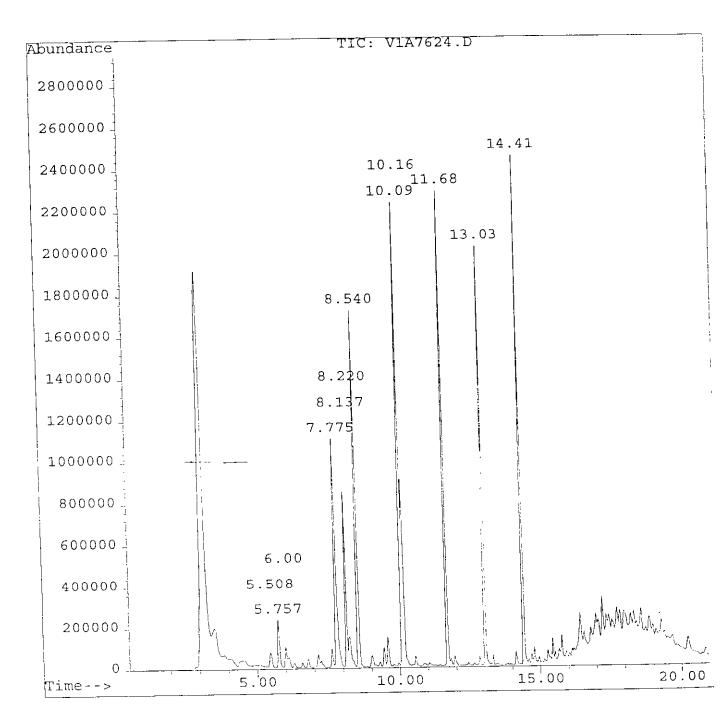
Vial: 14

Quant Time: Jan 2 16:46 1997

Method : c:\HPCHEM\1\METHODS\V18260.M

Title : Method 8260 - Water and Medium Soil

Last Update : Mon Dec 30 13:12:36 1996 Response via : Multiple Level Calibration



Data File : c:\hpchem\1\data\dec2696\v1a7627.d

Acq On : 26 Dec 96 5:43 pm : S & W/C1515-02/ 1SW 2D Sample : 5ML+10uL VW961223D Misc

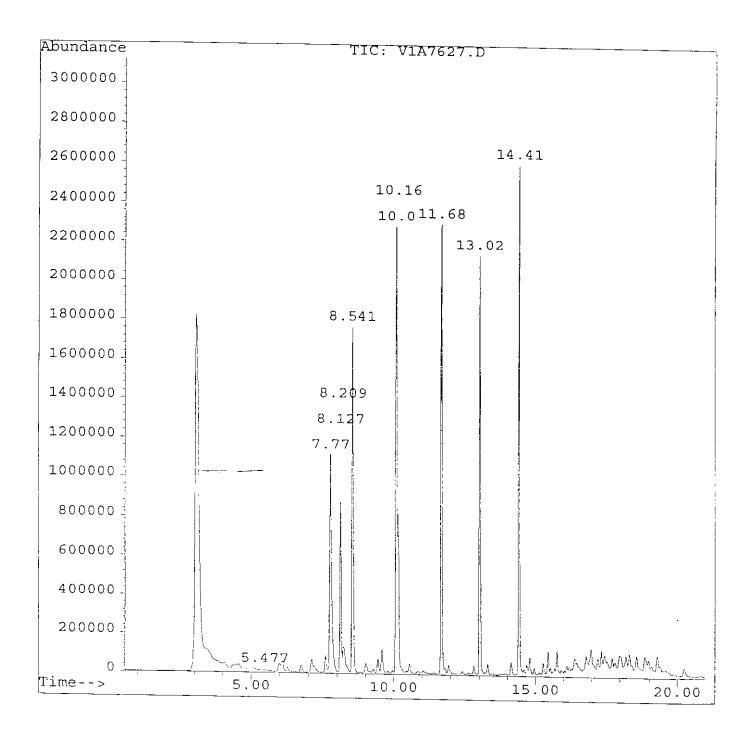
Vial: 1 Operator: CPS Inst : V1 Multiplr: 1.00

Quant Time: Jan 2 16:49 1997

: c:\HPCHEM\1\METHODS\V18260.M Method

: Method 8260 - Water and Medium Soil Title

Last Update : Mon Dec 30 13:12:36 1996 Response via : Multiple Level Calibration



pata File : c:\hpchem\1\data\dec2696\v1a7628.d

: 26 Dec 96 6:11 pm Acq On : S & W/C1515-03/ 1SW 1X Sample : 5ML+10uL VW961223D Misc

Operator: CPS : Vl Inst Multiplr: 1.00

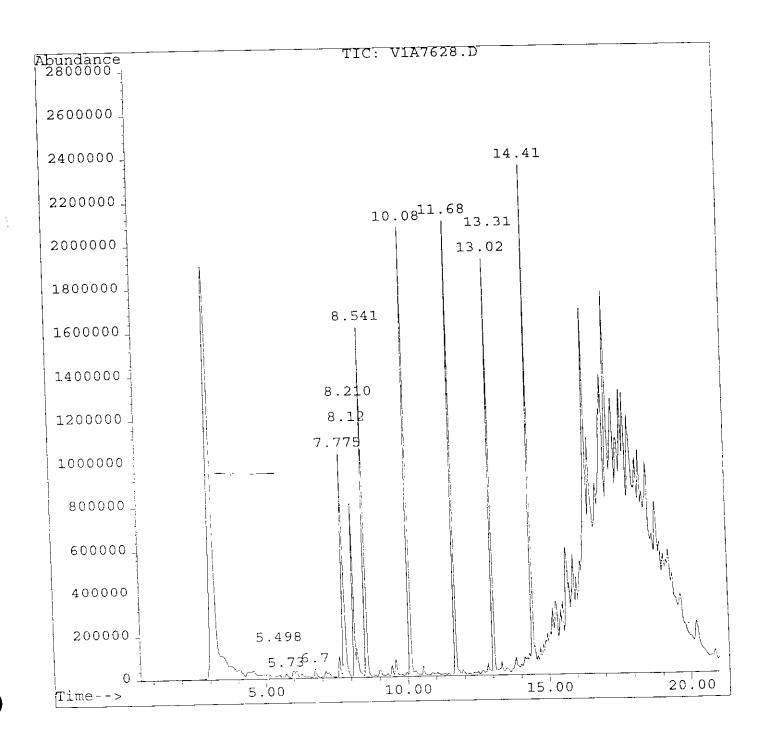
Vial: 2

Quant Time: Jan 2 16:50 1997

: c:\HPCHEM\1\METHODS\V18260.M Method

: Method 8260 - Water and Medium Soil Title

Last Update : Mon Dec 30 13:12:36 1996 Response via : Multiple Level Calibration



Data File : c:\hpchem\1\data\dec2696\v1a7623.d

: 26 Dec 96 3:52 pm Sample : S & W/C1515-05/ TRIP BLANK(8260A)

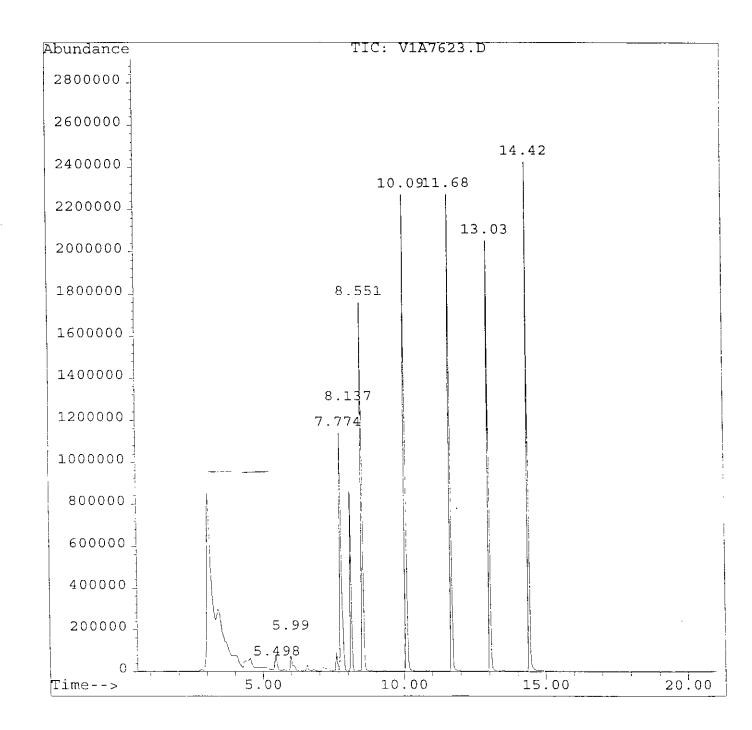
: 5ML+10uL VW961223D Misc

Ouant Time: Jan 2 16:45 1997

: c:\HPCHEM\1\METHODS\V18260.M Method

: Method 8260 - Water and Medium Soil Title

Last Update : Mon Dec 30 13:12:36 1996 Response via : Multiple Level Calibration



Vial: 13

: V1

Operator: CPS

Multiplr: 1.00

Inst

MITKEM CORPORATION

Logged In By:

Reviewed By:

Date: 12-16-96

Time: 1050

Lab Project #:

C1515

Client Name:

Stone & Webster Engineering Corporation

Client Project #:

NA

Client PO #:

PS 29472

Project Name:

Barnes Building

Date Duc:

Total Price:

Lab ID

\$

Deliverables Req'd: Case Completed:

1/4/97 1-3-97 145

COE

YES

Client ID

Matrix	Analysis	<u>Price</u>	Sampled	Received	Comments

-()	I	1SW 2X	AQ	PP METALS VPH EPH		12/12/96	12/13/96	
				8260A				PLEASE INCLUDE TIC'S & CHROMATOGRAMS
				8081 O & G 413.1				
				418.1				
-()	I/MS	ISW 2 MS	AQ	PP METALS		12/12/96	12/13/96	
				VPH EPH				
				8260A				PLEASE INCLUDE TIC'S & CHROMATOGRAMS
				8081				
				O & G 413.1 418.1				
				110.1				
-()	I/MSD	1SW 2 MSD	AQ	PP METALS		12/12/96	12/13/96	
				VPH EPH				
				8260A				PLEASE INCLUDE TIC'S & CHROMATOGRAMS
				8081				
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	9	•		418.1				
-07	0053	ISW 2D	AQ	PP METALS		12/12/96	12/13/96	
	12/16/06	0·44 AM			Page 1 c	of 2		Lab Project #: C1515 (2)

MITKEM CORPORATION

<u>Lab ID</u>	Client ID	<u>Matrix</u>	<u>Analysis</u> VPH	<u>Price</u>	<u>Sampled</u>	Received	Comments
			EPH 8260A 8081 O & G 413.1 418.1				PLEASE INCLUDE TIC'S & CHROMATOGRAMS
-03	ISW 1X	AQ	PP METALS VPH EPH 8260A 8081 O & G 413.1 418.1		12/12/96	12/13/96	PLEASE INCLUDE TIC'S & CHROMATOGRAMS
-04	Trip Blank (VPH)	AQ	VPH		12/12/96	12/13/96	
-05	Trip Blank (8260A)	AQ	8260A		12/12/96	12/13/96	PLEASE INCLUDE TIC'S & CHROMATOGRAMS
NOTES: (1) 8260A PLEASE	INCLUDE TIC'S & CHRO)MATQGRA	MS		<u>TPH</u> 5	<u>IR</u> 10	$\begin{array}{c ccccccccccccccccccccccccccccccccccc$

ORIGINAL REPORT GOES TO:

Stone & Webster Engineering Corporation

245 Summer Street Boston, MA 02210 ATT: Kevin Scully Phone: 617 589-2291 Fax: 617 589-2922 **INVOICE GOES TO:**

same

COOLER RECEIPT FORM

Number of Coolers: Z
LIMS #: Date received:
Project: Barnes Building
USE OTHER SIDE OF THIS FORM TO NOTE DETAILS CONCERNING CHECK-IN PROBLEMS
A.PRELIMINARY EXAMINATION PHASE: Date cooler was opened:
by (print): 1916 Shippie (sign): Mark Shippie
1. Did cooler come with a shipping slip (airbill, etc.)?YES NO
If YES, enter carrier name and airbill number here:
2. Were custody seals on outside of cooler YES NO
How many and where: 290055/1d, seal date:, seal name:
3. Were custody seals unbroken and intact at the date and time of arrival YES NO
4. Were custody papers sealed in a plastic bag and taped inside the kd?YES NO
5. Were custody papers filled out properly (ink, signed, etc.) YES NO
6.Did you sign custody papers in the appropriate place YES NO
7. Was project identifiable from custody papers? If YES, enter project name at the top of this form YES O
8. If required, was enough ice used? Type of ice: influsion TES NO
9. Have designated person initial here to acknowledge receipt of cooler: // (date) 12/13/96
B.LOG-IN PHASE: Date samples were logged in:
by (print): //// Suffic (sign): //with Sugget
10. Describe type of packing in cooler: Dubble packaging
11. Were all bottles sealed in separate plastic bage YES NO
12.Did all bottles arrive unbroken and were labels in good condition?YES NO
13. Were all bottle labels complete (ID, date, time, signature, preservative, etc.) YES NO
14.Did all bottle labels agree with custody papers YES NO
15. Were correct containers used for the tests indicated YES NO
16. Were correct preservatives added to samples? YES NO
17. Was a sufficient amount of sample sent for tests indicated? YES NO
18. Were bubbles absent in VOA samples? If NO, list by sample #:YES NO
19. Was the project manager called and status discussed? If YES, give details on the back of this formYES NO
20. Who was called? By whom? (date):



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1232 East Broadway Road, Suite 210 ● Tempe, Arizona 85282 (602 303-9535 ● Fax (602) 921-2883

CHAIN-OF-CUSTODY RECORD

4. 1 Page 2 of 4

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NAME Kevin	FAX	7.5	89-2922	NAM	NAME Kevin Sculy Ex7 559 29. ADDRESS 245 Summer St																			
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CHAIN-OF-CUSTODY RECORD

Page 4 of 4

		INVOICE TO																								
	COMPANY 5 & W	PHO	NE		СОМ	PANY	55	W	}						PHON	ИE				LAB RE	FERENCE #:					
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WHITE: LABORATORY COPY

YELLOW: REPORT COPY

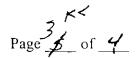
PINK: CLIENT'S COPY



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CHAIN-OF-CUSTODY RECORD



REPOR	RT TO				
COMPANY SECU	PHO	NE	COMPANY 5, W	PHONE	LAB REFERENCE #:
NAME KS See	FAX		NAME KS 600	e FAX	
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WHITE: LABORATORY COPY

YELLOW: REPORT COPY

PINK: CLIENT'S COPY



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CHAIN-OF-CUSTODY RECORD

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Page 6 of 4

	REPORT TO															INV	OICI	е то				·]		
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APPENDIX D

LABORATORY DATA VALIDATION REPORTS

STONE & WEBSTER REVIEW

Barnes Groundwater Sump Data Evaluation March 7, 1997

Introduction

- Data Completeness: The LCS run on 12/30/96 was missing results for thallium and selenium. MS/MSD results for oil & grease were also missing. For VOCs, only a fraction of the analytes were spiked in the LCS run. The VOC BFB (GC/MS tune) results were missing. Also, there were no surrogate recovery information on the matrix spike summary sheets. The laboratory was contacted on 2/24/97. BFB tune results were received on 2/26/97. Thallium and selenium for the 12/30/96 LCS were included in a resubmittal dated 2/18/97. The laboratory mistakenly analyzed one of the MS and MSD samples for oil & grease unspiked, so there wasn't enough sample remaining to perform an MS/MSD. The laboratory was also in error by not spiking all of the VOC analytes in the LCS run. The surrogate recoveries for MS/MSD runs were submitted on 3/7/97.
- Holding Times: The laboratory exceeded the extraction holding times for organochlorine pesticides by one day. The action taken was to estimate all positive results J and ND results UJ in all samples for organochlorine pesticides.
- Gas Chromatograph/Mass Spectrophotometer (GC/MS) Tuning: Bromofluorobenzene (BFB) results were reviewed and determined to be within specified criteria.

Blanks

- VOCs: No VOCs were detected in method blank V1B1226A analyzed on 12/26/96. Also, no VOCs were detected in the Trip Blank, analyzed on 12/26/96.
- Organochlorine Pesticides and Oil & Grease: No oil & grease was detected in the method blank 1231-B1 analyzed on 12/31/96. No organochlorine pesticides were detected in method blank P1220-B2, analyzed on 12/29/96.
- EPH/VPH: No contamination was detected in either EPH method blank EPH1219-B1 or VPH method blank V41223A. In the VPH Trip Blank analyzed on 12/24/96, C9-C10 aromatics were detected at 35 ug/L. The action taken was to qualify C9-C10 aromatics J in samples 1SW2X, 1SW2D, and 1SW1X.
- Fig. TPH: No TPH was detected in method blank 1219-B1, analyzed on 12/26/96.
- Metals: Antimony and copper were detected at 3 and 5 ug/L, respectively in preparation blank 1219PBW, analyzed on 12/30/96. Antimony, copper, and zinc were detected at 3, 10, and 10 ug/L, respectively in preparation blank 0115PBW, analyzed on 1/17/97. Actions taken were to qualify antimony and copper U in sample 1SW2D, and qualify copper U in sample 1SW1X.

Surrogate Spike Recoveries

All system monitoring compound recoveries were within contract required QC limits for both VOCs and organochlorine pesticides in all samples. For EPH, surrogate recoveries could not be determined in 1SW1X due to coeluting interferences. Therefore, all positive hits were qualified J and all NDs UJ in EPH sample 1SW1X. For VPH, surrogate 2,5-dibromotoluene had a %R of 121% (QC limits 80-120%) in sample Trip Blank. As a result, the C9-C10 aromatics result in Trip Blank was qualified J.

MS/MSD and LCS

- > VOC: For VOCs, all %R and RPD were within QC criteria for the MS/MSD runs. In the VOC LCS run, 2-hexanone (169%), carbon disulfide (166%), acetone (212%), and methyl ethyl ketone (207%), exceeded %R QC limits. Also, a number of analytes were not spiked, so the validator is unable to assess laboratory accuracy for these analytes. Actions taken were to qualify acetone and carbon disulfide J in sample 18W2X.
- Inorganic Analyses: In the MSD run, copper had a %R of 134% (QC limits 75-125%). No action was taken since copper was ND in the unspiked sample, 1SW2X. RPDs between spike and spike duplicate %Rs were less than 17%. For the 12/30/96 LCS run, recoveries were acceptable, falling between 93 and 104%. For the 1/17/97 LCS run, recoveries were also acceptable, falling between 95 and 107%.
- O&G: There was no O&G MS/MSD performed.
- > TPH: MS and MSD %Rs, and the RPD between %Rs were acceptable. The LCS sample recovery, 99%, was also acceptable. All spike samples were run on 12/26/96.
- Organochlorine Pesticides: The MS and MSD runs had recoveries of 187 and 198%, respectively for endrin. No action was taken since endrin was ND in the unspiked sample. In the LCS run, endrin (215%), endrin ketone (158%), endrin aldehyde (129%), endosulfan II (133%), and endosulfan sulfate (137%) had high recoveries. The only qualification was to estimate endosulfan sulfate J in 1SW1X.
- EPH/VPH: For VPH, all %Rs, and the RPD between %Rs were acceptable. For the VPH LCS run, all %Rs were QC limits. For EPH, the MS and MSD runs both had 31%R for C19-C36 aliphatics (QC limits 60-140%) and 48 and 50% for chrysene (QC limits 60-140%). For the EPH LCS run, all %Rs were acceptable. Actions taken were to qualify C19-C36 aliphatics J in EPH sample 1SW2X. Chrysene was ND in the unspiked sample so no action was required.

Field Duplicates

- VOC Analyses: For VOCs, carbon disulfide and acetone were detected at 19 and 6 ug/L, respectively in 1SW2X and were both ND in 1SW2D. Acetone and carbon disulfide were already qualified J in 1SW2X due to poor LCS recoveries so no further qualification is required for that sample. Also qualify acetone and carbon disulfide UJ in sample 1SW2D.
- Inorganic Analyses: In field duplicate samples 1SW2X and 1SW2D, antimony and copper were both ND in 1SW2X and 4 and 6 ug/L, respectively

in 1SW2D. Normally, antimony and copper would be qualified J in 1SW2D, but they have already been qualified U in 1SW2D. The metals lab duplicate results were all ND and therefore met duplicate precision criteria of \pm CRDL.

- O&G: Field duplicate and lab duplicate O&G results both had RPDs of 40%. Although this exceeds the QC limit for water duplicates, one of the duplicate values was less than 5 X CRDL, so no qualifying actions were made.
- > TPH: Field duplicate results for TPH were QC limits for precision.
- > Organochlorine Pesticides: All results were ND for the field duplicate samples, so precision criteria were met.
- PH/VPH: For EPH, all %Ds were within QC limits of 25%. For VPH, the C9-C10 aromatics results had a %D of 26.1%. Normally, flag the C9-C10 aromatics results J in 1SW2X and 1SW2D, but they have already been qualified J due to Trip Blank contamination.

ORGANIC ANALYSIS (KESTREL)

Ms. Deborah L. Smith Kestrel Environmental Technologies. Inc. 33 Sequoia Dr. Freeport, ME 04032

Mr. Kevin Scully Stone & Webster Environmental Technology & Services 245 Summer Street Boston, MA 02210

RE: Contract/Work Assignment #:DACW33-94-D-0007 Data Validation Letter Report, J.O.# 05000.24 Stone & Webster Subcontract #: PS-029471

Lab Name: Mitkem, Warwick R.L. Site Name: Barnes Building Project.

Dear Mr. Scully:

Enclosed are the data validation package for Barnes Building Project and the original data package provided to Kestrel Environmental Technologies. Inc. Thank you for the opportunity to perform these validation services.

Based upon the available information the data appear to be scientifically valid, although the omission of some pieces of data limited the review. The submission of run logs, actual spike calculations, and the laboratory derived precision and accuracy data would have enhanced the validation process. Additionally, for multiple analyte methods only a partial list of analytes was sometimes spiked. While Army Corp usually requires a full list of analytes in the spike, if this is not specifically contracted with the laboratory it may not be provided.

If we can be of any further assistance, please contact me at the above address or by phone at 207/865-1256.

Sincerely,

Kestrel Environmental Technologies. Inc

while I was

Deborah L. Smith

President

20 February 1997

Mr. Kevin Scully Stone & Webster Environmental Technology & Services 245 Summer Street Boston, MA 02210

RE:

Organic Data Validation Letter Report, J.O.# 05000.24

Stone & Webster Subcontract #: PS-029471

Lab Name: Mitkem Corp. and Lancaster Laboratories

Site Name: Barnes Building, Boston, MA

Organic Analysis

Samples Collected:

1AR1X
2ARIX
3ARIX
1SW2X
1SW2D
1SW1X
TRIP BLANK

Dear Mr. Scully:

The requirements of this data validation are specified in the 16 August 1989 memorandum from CEMRD-ED-GC. This data validation was performed on the organic analytical data from samples collected by Stone and Webster at the Barnes Building, Boston, MA. site. Two laboratories were used; the first, Mitkem Corp., analyzed the samples in accordance with SW-846 method 8260A and by USEPA method 8081. The second laboratory, Lancaster Laboratories, analyzed the air samples in accordance with method TO14. The data were evaluated based on the following parameters in accordance with standard USEPA data validation guidelines:

- chain of custody documents
- sample log-in documents
- * trip blanks, field blanks, and method blanks
- MS/MSD results
- LCS/LCSD results
- field duplicate results
- surrogate recoveries

- holding times

* All criteria were met for this parameter.

Chain of Custody Records

The laboratory receiving the 8260A vials, Mitkem Corp., did not note in their narrative or log-in documents whether or not they checked preservation (pH). The laboratory receiving the air canisters for TO14 analyses, Lancaster Laboratories, did not note the pressure of each canister upon receipt on the log-in documents, although they were noted on each sample results page.

Matrix Spike / Matrix Spike Duplicate Results

No matrix spike/matrix spike duplicate pair is required by method TO14. USACE requires for both methods 8260A and 8081 a MS/MSD pair spiked with all target analytes, with laboratory-derived statistical limits calculated for each analyte. Mitkem spiked a subset of the target analytes and did not provide any statistical limits. Kestrel used nominal QC limits of 80-120 % for evaluation (obtained from the USACE Methods Compendium (Version 1.1. 092496) and evaluated only these analytes actually spiked by Mitkem. Mitkem should be reminded of these USACE requirements.

Given these deficiencies, the following MS/MSD recoveries and/or RPDs did not meet criteria:

FRACTION	COMPOUND	% REC	QC LIMITS
8081/MSD	gamma-BHC	76	80-120
8081/MS	aldrin	78	80-120
8081/MSD	aldrin	70	80-120
8081/MS	endrin	187	80-120
8081/MSD	endrin	198	80-120

No data validation qualifications are recommended based upon these MS/MSD results.

Laboratory Control Sample/Laboratory Control Sample Duplicate Results

No LCS is required for method TO14. As with the MS/MSD, "the LCS must contain all single-component target analytes, surrogates, and a subset of the multiple component target analytes." Mitkem again chose to spike only a subset of the single component analytes, and no multiple component analytes. Also, USACE regulations state that "control limits for aqueous and soil matrices must be generated for all target analytes and surrogates in the LCS." Mitkem did not provide any control limits.

1- USACE Methods Compendium (Version 1.1, 092496)

Given these deficiencies, the following LCS recoveries did not meet the nominal 80-120% limits:

FRACTION	COMPOUND	% REC	QC LIMITS
8260A	chloromethane	75	80-120
8260A	vinyl chloride	76	80-120
8260A	carbon disulfide	166	80-120
8260A	acetone	212	80-120
8260A	2-butanone	207	80-120
8260A	4-methyl-2- pentanone	125	80-120
8260A	2-hexanone	169	80-120
8081	delta-BHC	124	80-120
8081	endrin	215	80-120
8081	endosulfan II	133	80-120
8081	endrin aldehyde	129	80-120
8081	methoxychlor	122	80-120
8081	endosulfan sulfate	137	80-120
8081	endrin ketone	158	80-120

The following 8260A data validation qualifications are recommended based upon these results:

- (1) estimate (UJ) detection levels of chloromethane and vinyl chloride in all samples.
- (2) estimate (J) positive detects of carbon disulfide and acetone in 1SW2X.

The following method 8081 data validation action is recommended:

(1) estimate (J) the laboratory positive detects of delta-BHC and endosulfan sulfate in 1SW1X.

No other data validation qualifications are recommended based upon these LCS results.

Field Duplicate Results

One field duplicate pair for methods 8260A and 8081, 1SW2X and 1SW2D, was sampled at this site. The following table lists analytes which did not meet the RPD criteria:

Fraction	COMPOUND	RPD
8260A	carbon disulfide	200
8260A	acetone	200
8260A	toluene	17

The following data validation qualifications are recommended based upon these results:

- (1) estimate (J) the laboratory positive detects of carbon disulfide and acetone in 1SW2X.
- (2) estimate (UJ) the detection levels of carbon disulfide and acetone in 1SW2D.

No other data validation action is recommended based upon these field duplicate results.

Surrogate Results

Method 8260A and USACE mandate the use of four surrogates with laboratory derived limits. Mitkem used three surrogates with no apparent statistical limits. The validator evaluated surrogate recoveries against nominal limits of 80-120%.

Holding Times

There is no confirmation of sample preservation for volatile analysis.

For method 8081, all three aqueous samples were extracted one day past expiration of the seven day aqueous extraction holding time. Due to this, it is recommended to:

- (1) estimate (J) the laboratory positive detects of delta-BHC and endosulfan sulfate in sample 1SW1X.
- (2) estimate (UJ) all detection levels for samples analyzed by this method.

Summary

The 8260A data has been qualified due to LCS recovery deviations and sample duplicate precision results. It is recommended to qualify the 8081 data for LCS recovery deviations and extraction holding time violations. No TO14 air data qualifications are recommended.

The laboratory performing the 8081 and 8260A analyses, Mitkem Corporation, should be reminded of the necessity of adhering to the USACE requirements noted in this report.

Appended tables summarize the qualified volatile method 8260A analytical results and 8260A tentatively identified compound findings, as well as the qualified pesticide/PCB method 8081 analytical results. A separate table summarizes the TO14 air results and tentatively identified results. The data review worksheets are also appended to this memorandum.

Sincerely,

Kestrel Environmental Technologies, Inc.

Deborah L. Smith, President

Table Ia- Volatiles Recommendation Summary

8260A				
Sample	Qualifier			
ISW2X	Qualifier A^{I}, A^{2}, A^{3} A^{I}, A^{4}			
ISW2D	A^I, A^4			
1SW1X	A^{I}			
TRIP BL4NK	A^{T}			
	, ,			
"				

- A accept all data.
- A¹- accept data, but estimate (UJ) detection levels of chloromethane and vinyl chloride due to low recoveries in the LCS.
- A²- accept data, but estimate (J) laboratory positive detects of carbon disulfide and acetone due to high LCS recoveries.
- A³- accept data, but estimate (J) laboratory positive detects of carbon disulfide and acetone due to poor sample/sample duplicate precision.
- A⁴- accept data, but estimate (UJ) detection levels of carbon disulfide and acetone due to poor sample/sample duplicate precision.

Table Ib- Air Recommendation Summary

TO14				
Sample	Qualifier			
LAR LX	A			
2.4R I.X	A			
3AR1X	A			
t	<u> </u>			

A - accept all data

Table Ic- Pesticides Recommendation Summary

8081			
Sample	Qualifier		
ISW2X	J^2		
ISW2D	$\frac{J^2}{A^I, J^I, J^2}$		
ISWIX	A^{I},J^{I},J^{2}		
, , , , , , , , , , , , , , , , , , , ,			

- A Accept all data.
- A¹- accept data, but estimate (J) positive results of delta-BHC and endosulfan sulfate due to high LCS recoveries.
- J¹- estimate (J) positive detects of delta-BHC and endosulafan sulfate due to exceedance of extraction holding times.
- J²- estimate (UJ) all detection levels due to exceedance of extraction holding times.

Volatile (8260A) Validated Results

Project #: PS-029471 J.O. #: 500024

S&W Sample Number:	1SW2X	ISW2D	1SW1X	TRIP BLANK
Lab Sample Number:	C1515-01	C1515-02	C1515-03	C1515-05
Matrix/Analysis:	AQ/LOW	AQ/LOW	AQ/LOW	AQ/LOW
Sample Type:	ROUTINE	FIELD DUP	ROUTINE	TRIP BLK
Dilution Factor:	1	1	1	1
Date Sampled:	12/12/96	12/12/96	12/12/96	12/12/96
Date Extracted:	NA	NA	NA	NA
Date Analyzed:	12/26/96	12/26/96	12/26/96	12/26/96
Percent Moisture:	NA	NA	NA	NA
				_ '
Dichlorodifluoromethane	5 U	5 U	5 U	5 U
Chloromethane	5 UJ	5 UJ	5 UJ	5 UJ
Vinyl chloride	5 UJ	5 UJ	5 UJ	5 UJ
Bromomethane	5 U	5 U	5 U	5 U
Chloroethane	5 U	5 U	5 U	5 U
Frichlorofluoromethane	5 U	5 U	5 U	5 U
l, l-Dichloroethene	5 U	5 U	5 U	· 5 U
Carbon disulfide	19 J	5 UJ	5 U	5 U
odomethane	5 U	5 U	5 U	5 U
Acetone	6 J	5 UJ	5 U	5 U
Methylene chloride	5 U	E TT	, 5 U	5 U
rans-1,2-Dichloroethene	. 5 U	5 U	5 U	5 U
1.1-Dichloroethane	5 U	5 U	5 U	5 U
Vinyl acetate	5 U	5 U	5 U	5 U
2.2-Dichloropropane	5 U	5 U	5 U	5 U
cis-1.2-Dichloroethene	, 5 U	5 U	5 U	5 U
2-Butanone	5 U	5 U	5 U	. 5 U
Bromochloromethane	5 U	5 U	5 U	5 U
Chloroform	5 U	5 U	5 U	5 U
1,1,1-trichloroethane	5 U	5 U	. 5 U	5 U
Carbon tetrachloride	. 5 U	5 U	5 U	5 U
1.1-Dichloropropene	5 U	5 U	5 U	5 U
Benzene	, 5 U	5 U	5 U	5 U
1,2-Dichloroethane	5 U	5 U	5 U	5 U
Trichloroethene	. 5 U	5 U	5 U	5 U
1.2-Dichloropropane	5 U	5 U	5 U	5 U
Dibromomethane	5 U	. 5 U	5 U	. 5 U
Bromodichloromethane	5 U	5 U	5 U	5 U
2-Chloroethylvinylether	5 U	5 U	5 U	5 U
cis-1,3-dichloropropene	5 U	5 U	5 U	5 U
4-methyl-2-pentanone	5 U	5 U	5 U	5 U
Toluene	19	16	5 U	5 U
Trans-1.3-dichloropropene	5 U	5 U	. 5 U	5 U
1,1,2-Trichloroethane	5 U	5 U	5 U	5 U
Tetrachloroethene	5 U	5 U	5 U	5 U
1,3-Dichloropropane	5 U	5 U	5 U	5 U
2-Hexanone	5 U	5 U	5 U	5 U
Dibromochloromethane	5 U	5 U	5 U	5 U
1,2-Dibromoethane (EDB)	5 U	5 U	5 U	5 U
Chlorobenzene	5 U	5 U	5 U	5 U

Volatile (8260A) Validated Results

Project #: PS-029471 J.O. #: 500024

S&W Sample Number:	1SW2X	1SW2D	1SW1X	TRIP BLANK
Lab Sample Number:	C1515-01	C1515-02	C1515-03	C1515-05
Matrix/Analysis:	AQ/LOW	AQ/LOW	AQ/LOW	AQ/LOW
Sample Type:	ROUTINE	FIELD DUP	ROUTINE	TRIP BLK
Dilution Factor:	1	<u>l</u>	1	1
Date Sampled:	12/12/96	12/12/96	12/12/96	12/12/96
Date Extracted:	NA	NA	NA	NA
Date Analyzed:	12/26/96	12/26/96	12/26/96	12/26/96
Percent Moisture:	NA	NA	NA_	NA_
1,1,1,2-Tetrachloroethane	5 U	5 U	5 U	5 U
Ethylbenzene	5 U	5 U	5 U	5 U
Xylenes (total)	5 U	5 U -	5 U	5 U
Styrene	5 U	5 U	5 U	5 U
Bromoform	5 U	, , ,	5 U	5 U
Isopropylbenzene	5 U	5 U	5 U	5 U
Bromobenzene	_ 5 U	5 U	5 U	5 U
1.1.2,2-Tetrachloroethane	5 U	5 U	5 U	5 U
1,2,3-Trichloropropane	5 U	5 U	5 U	5 U
n-propylbenzene	5 U	5 U	5 U	5 U
2-chlorotoluene	5 U	5 U	5 U	5 U
4-chlorotoluene	5 U	5 U	5 U	5 U
1,3,5-trimethylbenzene	5 U	5 U	5 U	5 U
tert-butylbenzene	5 U	. 5 U	5 U	5 U
1.2.4-trimethylbenzene	5 U	5 U	5 U	5 U
sec-butylbenzene	5 U	5 U	5 U	5 U
1.3-dichlorobenzene	5 U	5 U	5 U	5 U
4-isopropyltoluene	5 U	5 U	5 U	5 U
1.4-dichlorobenzene	5 U	5 U	5 U	5 U
1.2-dichlorobenzene	5 U	5 U	5 U	5 U
n-butylbenzene	5 U	5 U	5 U	5 U
1.2-dibromo-3-chloropropane	5 U	5 U	5 U	5 U
1.2.4-trichlorobenzene	5 U	5 U	5 U	5 U
Hexachlorobutadiene	5 U	5 U	5 U	5 U
1.2.3-Trichlorobenzene	5 U	5 U	5 U	5 U
MTBE	5 U	5 U	5 U	5 U

J - The associated numerical value is an estimated quantity.

U - The compound was not detected. The associated numerical value is the compound quantitation limit.

UJ - The compound was not detected. The compound quantitation limit is an estimated value.

R - The datum was rejected.

Volatile (8260A) TIC Results

Project #: PS-029471 J.O. #: 500024

S&W Sample Number:	1SW2X	1SW2D	1SW1X	TRIP BLANK
Lab Sample Number:	C1515-01	C1515-02	C1515-03	C1515-05
Matrix/Analysis:	AQ/LOW	AQ/LOW	AQ/LOW	AQ/LOW
Sample Type:	ROUTINE	FIELD DUP	ROUTINE	TRIP BLANK
Dilution Factor:	1	i l	1	l
Date Sampled:	12/12/96	12/12/96	12/12/96	12/12/96
Date Extracted:	NA	NA	NA	NA
Date Analyzed:	12/26/96	12/26/96	12/26/96	12/26/96
Percent Moisture:	NA	NA	NA	NA
Hydrocarbon	3X			
C4-benzene			X	
Unknown hydrocarbon			2X	
Aliphatic hydrocarbon			2N	
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X - The compound was detected in the sample; the numerical label indicates the number detected, if more than one.

B- The compound was detected in the associated method blank.

Project #: PS-029471 J.O. #: 500024

S&W Sample Number:	1AR1X	2AR1X	3AR1X
Lab Sample Number:	2633481	2633480	2633482
Matrix/Analysis:	SUMMA CAN	SUMMA CAN	SUMMA CAN
Sample Type:	ROUTINE	ROUTINE	ROUTINE
Dilution Factor:	1	1	1.2
Date Sampled:	12/13/96	12/12/96	12/13/96
Date Extracted:	NA	NA	NA
Date Analyzed	12/19/96	12/30/96	12/19/96
Percent Moisture:	NA	NΛ	NA
	<u> </u>		
Dichlorofluoromethane	1	6	6
Freon 114	1 U	1 U	1 U
Chloromethane	1 U	1 U	1
Vinyl chloride	1 U	l U	1 U
Bromomethane	1 U	1 U	1 U
Chloroethane	1 U	1 U	1 U
Trichlorofluoromethane	5	2	3
1.1-Dichloroethene	1 U	1 U	1 U
Freon 113	l U	1 U	ΙŪ
3-chloropropene	ΙU	1 U	1 U
Methylene chloride	1 U	l U	1 U
1.1-dichloroethane	1 U	ΙU	1 U
cis-1,2-dichloroethene	1 U	1 U	1 U
chloroform	I U	1 U	1 U
1.1.1-trichloroethane	1 U	1 U	I U
carbon tetrachloride	l U	1 U	1 U
1.2-dichloroethane	19	15	4
benzene	ΙÜ	1 U	1 U
trichloroethene	1 U	1 U	I U
1.2-dichloropropane	1 U	l U	1 U
cis-1,3-dichloropropene	1 U	1 U	1 U
tolucne	4	5	14
trans-1,3-dichloropropene	1 U	1 U	1 U
1,1.2-trichloroethane	l U	1 U	1 U
tetrachloroethene	1	1	ΙŪ
1.2-dibromoethane	l U	1 U	I U
chlorobenzene	I U	1 U	1 U
ethylbenzene	1 U	1 U	1 U
m/p-xylene	1 U	1	2
o-xylene	1 U	I U	l U
styrene	1 U	l U	1 U
1.1.2.2-tetrachloroethane	1 U	1 U	1 U

J - The associated numerical value is an estimated quantity.

U - The compound was not detected. The associated numerical value is the compound quantitation limit.

UJ - The compound was not detected. The compound quantitation limit is an estimated value.

R - The datum was rejected.

Project #: PS-029471 J.O. #: 500024

S&W Sample Number:	1AR1X	2AR1X	3AR1X
Lab Sample Number:	2633481		2633482
Matrix/Analysis:	SUMMA CAN	SUMMA CAN	SUMMA CAN
Sample Type:	ROUTINE	ROUTINE	ROUTINE
Dilution Factor:	1	1	1.2
Date Sampled:	12/13/96	12/12/96	12/13/96
Date Extracted:	NA	NA	NA
Date Analyzed	12/19/96	12/30/96	12/19/96
Percent Moisture:	. NA	NA	NA
		•	
4-ethyltoluene	1 U	. I U	1 U
1.3.5-trimethylbenzene	1 U	1 U	ΙU
1.2.4-trimethylbenzene	1 U	1	2
1,3-dichlorobenzene	l U	1 U	1 U
1.4-dichlorobenzene	1 U	l U	1 U
benzyl chloride	1 U	1 U	1 U
1.2-dichlorobenzene	1 U	1 U	1 U
1,2,4-trichlorobenzene	1 U	1 U	1 U
hexachlorobutadiene	1 U	1 U	1 U
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J - The associated numerical value is an estimated quantity.

U - The compound was not detected. The associated numerical value is the compound quantitation limit.

UJ - The compound was not detected. The compound quantitation limit is an estimated value.

R - The datum was rejected.

Volatile Organics in Air TIC Results

Project #: PS-029471 J.O. #: 500024

S&W Sample Number:	1AR1X	2AR1X	3AR1X
Lab Sample Number:	2633481	2633480	2633482
Matrix/Analysis:	SUMMA CAN	SUMMA CAN	SUMMA CAN
Sample Type:	ROUTINE	ROUTINE	ROUTINE
Dilution Factor:	1	. 1	1.2
Date Sampled:	12/13/96	12/12/96	12/13/96
Date Extracted:	NA	NA	NA
Date Analyzed	12/19/96	12/30/96	12/19/96
Percent Moisture:	NA	NA	NA
	<u> </u>		
Рторапе	X	X	
Isobutane	X	X	X
Butane	X	X	X
Butane, 2-methyl	X	X	X
Pentane	X	X	X
Acctone	X	. X	X
Pentane, 2-methyl	X	X	X
Unknown aliphatic hydrocarbon- C7		X	
Acetamide, N.N-dimethyl-		X	
Unknown aliphatic hydrocarbon-C10		Z	
Unknown aliphatic hydrocarbon-C5	X	!	1
Hexane	X		
Unknown aliphatic hydrocarbon-C6	X		!
Unknown			X
Acetaldehyde			X
Ethanol			X
Unknown aliphatic hydrocarbon-C4			Х

X - The compound was detected in the sample: the numerical label indicates the number detected, if more than one.

B - The compound was associated with the blank.

Pesticide (8081) Validated Results

Project #: PS-029471 J.O. #: 500024

S&W Sample Number:	1SW2X	1SW2D	ISWIX
Lab Sample Number:	C1515-01	C1515-02	C1515-03
Matrix/Analysis:	AQ/LOW	AQ/LOW	AQ/LOW
Sample Type:	ROUTINE	FIELD DUP	ROUTINE
Dilution Factor:	1	1	1
Date Sampled:	12/12/96	12/12/96	12/12/96
Date Extracted:	12/20/96	12/20/96	12/20/96
Date Analyzed	12/29/96	12/29/96	12/29/96
Percent Moisture:	NA	NA	NA
alpha-BHC	0.05 UJ	0.05 UJ	0.05 UJ
gamma-BHC	0.05 UJ		0.05 UJ
Heptachlor	0.05 UJ	0.03 00	0.05 UJ
Aldrin	0.05 UJ	0.05 UJ	0.05 UJ
beta-BHC	0.05 UJ	0.05 UJ	0.05 UJ
delta-BHC	0.05 UJ	0.05 UJ	0.11 J
Heptachlor epoxide	0 05 UJ	0.05 UJ	0.05 UJ
Endosulfan I	0.05 UJ	0.05 UJ	0.05 UJ
4,4'-DDE	0.1 UJ	0.1 UJ	0.1 UJ
Dieldrin	0.1 UJ	0.1 UJ	0.1 UJ
Endrin	0.1 UJ	0.1 UJ	0.1 UJ
4.4'-DDD	0.1 UJ	0.1 UJ	0.1 UJ
Endosulfan II	0.1 UJ	0.1 UJ	0.1 UJ
4,4'-DDT	0.1 UJ	0.1 UJ	0.1 UJ
Endrin aldehyde	0 I UJ	0 1 UJ	0.1 UJ
Methoxychlor	0.5 UJ	0.5 UJ	0.5 UJ
Endosulfan sulfate	0.1 UJ	0.1 UJ	0.13 J
alpha-chlordane	0.05 UJ	0.05 UJ	0.05 UJ
gamma-chlordane	0.05 UJ	0.05 UJ	0.05 UJ
Endrin ketone	0.05 UJ	0.05 UJ	0.05 UJ
Toxaphene	5 UJ	5 UJ	5 UJ
Aroclor-1016	1 UJ	1 UJ	1 UJ
Aroclor-1221	2 UJ	2 UJ	2 UJ
Aroclor-1232	l UJ	l UJ	L UJ
Aroclor-1242	l UJ	1 UJ	1 UJ
Aroclor-1248	1 UJ	1 UJ	l UJ
Aroclor-1254	1 UJ	l UJ	1 UJ
Aroclor-1260	1 UJ	1 UJ	1 UJ

J - The associated numerical value is an estimated quantity.

U - The compound was not detected. The associated numerical value is the compound quantitation limit.

UJ - The compound was not detected. The compound quantitation limit is an estimated value.

R - The datum was rejected.

DATA REVIEW WORKSHEETS

Project Name:	Barnes Building	USACE Project #:	PS-029471
Location:	Boston, MA	Contract Number:	500024
	REV	TEW OF ORGANIC	
	D	OATA PACKAGE	
<u>-</u>	-	em Corp. and Lancaster Lab formance data summarized.	
Reviewer: Kes	trel Environmental Techn	ologies Sampling Da	ite(s) 12/12/96, 12/13/96
Validator: Del	orah Smith	Shipping Da	ite(s) 12 12 96, 12 13 96
No. of Samples/N	Matrix 4 Aqueous, 3 Ai	Date Rec'd by	Lab 12/13/96, 12/16/96
Sample Identifier	s: <u>1ARIX, 2ARIX, 3A</u>	R1X. 1SW2X. 1SW2D. 1SW	IX. TRIP BLANK
Trip Blank No.:	TRIP BLANK		
Equipment Blank	No: None provided		
Field Dup Nos.:	ISW2X. ISW2D	- 0 11 4-	
The methods revi	ewed in this package are:	8260A. 8081. TO14	
The general crite	eria used to determine syst	em performance were based	on an examination of:
Chain	of Custody	Motrix Snil	xe/Matrix Spike Dup.
	Log-in Documents	-	es (LCS/LCSD)
	insate Blanks	-Laboratory	
-Trip B		-Surrogate R	•
-Method	l Blanks	-Holding Tir	nes
results. No date	a qualifications are recon		nd sample duplicate precision nalyses. It is recommended to n holding times.
Definitions and	Qualifiers:		
	e data due to quality contr due to quality control crite		
Reviewer:	July Phy	<u>/</u>	Date: 2/20/97

I. CHAIN OF CUSTODY AND SAMPLE LOG-IN DOCUMENTS

Are all samples identified on the chain of custody?	YES	NO
Are sample dates and appropriate signatures present?	YES	NO
Were the samples containers intact?	YES	NO
Were the samples preserved according to protocol?	YES.	NO
Were custody seals present and intact?	YES	NO
Were the samples clearly and accurately labeled?	YES	NO

Explain any deviations: Mitkem did not note whether preservation of the VOA vials was checked immediately prior to analysis. The validator assumed that preservation occurred by the sampler. Mitkem should be advised to check preservation and note any deviations in the SDG narrative routinely.

II A. BLANK ANALYSIS RESULTS (Sections 1 & 2)

List the contamination in the blanks below.

1. Laborat	tory Method Blank	xs.		Level: Low
Date	Lab ID	Fraction/ Matrix	Compound	Concentrations/ Units
2. Equip	ment and Trip Bla	nks		
Date	Sample ID	Fraction/ Matrix	Compound	Concentrations/ Units

A separate worksheet should be used for low and medium level blanks.

II B. BLANK ANALYSIS RESULTS (Section 3)

Blank Actions

Action levels should be based upon the highest concentration of contaminant determined in any blank. The action level for samples which have been concentrated or diluted should be multiplied by the concentration/dilution factor. No positive sample result should be reported unless the concentration of the compound in the sample exceeds the action level of 10 x's the amount in the blank for the common contaminants, or 5 x's the amount for any other compound. Specific actions are as follows:

- 1. The concentration is less than the SQL, report the SQL
- 2. The concentration is greater than the SQL, but less than the action level, report the concentration found U.
- 3. The Concentration is greater than the action level, report the concentration unqualified.

Common contaminants = methyl	ene chloride, acetone	, 2-butanone, toluene, and phtha	ilates.
LEVEL: Low			
Compound	Max. Conc./ Units	Action Level/ Units	SQL

A separate worksheet should be used for low and medium level blanks.

III A. MATRIX SPIKE/MATRIX SPIKE DUPLICATE

 Matrix Spike/Matrix Spike Duplicate Recoveries and Precisi
--

Sample IDs	ISW2XMS	,	ISW2XMSD	Level:LOW	Matrix:AQUEOUS
-					

List the percent recoveries and RPD's of compounds which do not meet criteria.

Fraction/ MS or MSD	Compound	%REC/ RPD	QC Limits
8260.4 MS/ MSD	No Deviations, but Mitkem spiked only five analytes and provided no control limits. The validator used the nominal limits of 80-120% noted in the USACE methods compendium.		
8081 MSD	gamma-BHC	76	80-120
8081/MS	aldrin	78	80-120
8081/MSD	aldrin	70	80-120
8081-MS	endrin	187	80-120
8081-MSD	endrin	198	80-120
	Again, no statistically derived control limits were provided by Mitkem. The validator again used the nominal limits of 80-120%.		
			· · · · · · · · · · · · · · · · · · ·

QUALIFICATION IS LIMITED TO THE UNSPIKED SAMPLE ONLY.

1.	If any compound	does not meet	the criteria.	follow	the actions	stated below:

2. If any compound does not meet the RPD criteria, flag positive results for that compound as estimated (J).

A separate worksheet should be used for each MS/MSD pair.

IV LCS/LCSD (SPIKED BLANKS)

Laboratory Control Sample/Laboratory Control Sample Duplicate Recoveries and Precision					
Sample IDs <u>LCS</u> ,	Level: low	Matrix: Aqueous			
List the percent recoveries and RPD's of compounds which	do not meet criteria.				

Fraction/ LCS or LCSD	Compound	%REC/ RPD	QC Limits
8260A/8081	No control limits were provided by the laboratory; several target analytes were not spiked by the laboratory. Again, limits of 80-120% were used for validation.		
8260A/LCS	chloromethane	7.5	80-120
8260A·LCS	vinyl chloride	76	80-120
8260A/LCS	carbon disulfide	166	80-120
8260A·LCS	acetone	212	80-120
8260A·LCS	2-butanone	207	80-120
8260.4 LCS	4-methyl-2-pentanone	125	80-120
8260A LCS	2-hexanone	169	80-120
8081/LCS	delta-BHC	124	80-120
8081/LCS	endrin	215	80-120
8081·LCS	endosulfan II	133	80-120
8081-LCS	endrin aldehyde	129	80-120
8081 LCS	methoxychlor	122	80-120
8081-LCS	endosulfan sulfate	137	80-120
8081 LCS	endrin ketone	158	80-120

QUALIFICATION IS LIMITED TO THE UNSPIKED SAMPLE ONLY.

1.	If any comp	ound does not	meet the o	criteria, follow	the actions	stated below

2. If any compound does not meet the RPD criteria, flag positive results for that compound as estimated (J).

A separate worksheet should be used for each LCS/LCSD pair.

V. LABORATORY SAMPLE DUPLICATE PRECISION

Sample IDs	ISW2X	·	ISW2D	Matrix: _	Aqueous
List the concentra	tions of the comp	ounds which	h do not meet the laborat	ory RPD criteria:	

Fraction	Compound	Sample Conc	DUP Sample Conc	RPD
8260.4	carbon disulfide	19	5 U	200
8260A	acetone	6	5 U	200
82604	toluene	19	16	17
		· ·		

ACTIONS:

- 1. If the results for any compounds do not meet the RPD criteria, flag the positive results for that compound as estimated.
- 2. If one value is non-detected, and one is above the SQL:
 - a. Flag the positive result as estimated (J).
 - b. Flag the non-detected result as estimated (UJ).

Note: Professional judgment may be utilized to apply duplicate actions to all samples of a similar matrix.

A separate worksheet should be filled out for each laboratory duplicate pair.

List the percent recoveries which do not meet the criteria for surrogate recovery.

Matrix: Water

		VOA			B/N Ext		. A	Acid Ext			PE		
										TCMX	TCMX		DCB
Sample IDs	TOL	BFB	DCE	NBZ	FBP	TPH	PHL	2FP	TBP	1	2	11	2
				NA	NA	NA _	NA	NA	NA	ļ	NA		NA
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QC LIMITS	80	80	80	35	43	33	10	21	10	60	30	60	30
	to	to	to	to	to	to	to	to	to	to	to	to	to
	120	120	120	114	116	141	110	110	123	140	150	140	150

Surrogate Actions:

	PERG	CENT RECO	VERY
	<10%	10%-Min.	>Max
Positive sample results	J	J	J
Non-detected results	R	UJ	Α

Surrogate action should be applied:

- 1. If at least two surrogates in a B/N or A fraction or one surrogate in the VOA fraction are out of specification, but have recoveries of >10%.
- 2. If any one surrogate in a fraction shows <10% recovery.

List the percent recoveries which do not meet the criteria for surrogate recovery.

Matrix: SOIL

<u> </u>	[VOA		Ι	B/N Ext	. <u>-</u> .	A	Acid Ext		[PE	ST	
Sample IDs	TOI	BFB	DCE	NBZ	FBP	TPH	PHL	2FP	TBP	TCMX	TCMX 2	DCB 1	DCB 2
Sample 1D3	TOL	DID	DCL	INDE	I Di	1111	1.1.11	211	1111	 	-	,	
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QC LIMITS	84	59	70	23	30	18	24	25	19	30	30	30	30
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	138	113	121	120	115	137	113	121	122	150	150	150	150

Surrogate Actions:

Surrogate action should be applied:

- 1. If at least two surrogates in a B/N or A fraction or one surrogate in the VOA fraction are out of specification, but have recoveries of >10%.
- 2. If any one surrogate in a fraction shows <10% recovery.

List the percent recoveries which do not meet the criteria for surrogate recovery.

TPH Water

Sample IDs			TPH											
Sample IDS		_												
	Sample IDs													
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QC LIMITS to to to to to to to to to to to to to	QC LIMITS	to	to	to	to	10	to	10	10	10		10	to	10
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Surrogate Actions:

	PERO	CENT RECO	VERY
	<10%	10%-Min.	≥Max.
Positive sample results	J	J	J
Non-detected results	R	UJ	Α

Surrogate action should be applied:

- 1. If at least two surrogates in a B/N or A fraction or one surrogate in the VOA fraction are out of specification, but have recoveries of >10%.
- 2. If any one surrogate in a fraction shows <10% recovery.

List the percent recoveries which do not meet the criteria for surrogate recovery.

Matrix: SOIL

		TPH								· · · · · ·			
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Surrogate Actions:

Surrogate action should be applied:

1. If at least two surrogates in a B/N or A fraction or one surrogate in the VOA fraction are out of specification, but have recoveries of >10%.

If any one surrogate in a fraction shows <10% recovery.

VII. HOLDING TIMES

Complete table for all samples and circle the fractions which are not within criteria

		TO14	V	0A	Pe	est
Sample ID	Date Sampled	Date Anal	Date Extr	Date Anal	Date Extr	Date Anal
JARIX	12 13 96	12 19 96	NA NA	NA	NA.	NA NA
2ARIX	12-12/96	12-30-96	<i>NA</i>	NA NA	NA NA	NA NA
3AR1X	12/13/96	12/19/96	NA NA	NA	NA	NA
1SW2X	12/12/96	NA	NA	12-26:96	12/20/96	12.29/96
1SW2D	12 12 96	NA	NA -	12/26/96	12/20/96	12 29 96
1SW1X	12:12:96	NA	. NA	12/26/96	12/20/96	12 29 96
TRIP	12.12/96	NA	NA NA	12/26/96	NA.	NA
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VOA - Unpreserved: Aromatic within 7 days, non-aromatic within 14 days of sample collection.

Preserved: Both within 14 days of sample collection.

Soils: Both within 14 days of sample collection.

BNA & PEST - Extracted within 7 days, analyzed within 40 days, soils and water.

ACTION:

- 1. If holding times are exceeded all positive results are estimate (J) and non-detects are estimated (UJ).
- 2. If holding times are grossly exceeded, the reviewer may determine that non-detects are unusable (*).

VII. HOLDING TIMES

Complete table for all samples and circle the fractions which are not within criteria.

		TP	Н	Other				
Sample ID	Date Sampled	Date Extr	Date Anal	Date Extr	Date Anal			
	Sumpled	2/101	7					
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VOA - Unpreserved: Aromatic within 7 days, non-aromatic within 14 days of sample collection.

Preserved: Both within 14 days of sample collection.

Soils: Both within 14 days of sample collection.

BNA & PEST - Extracted within 7 days, analyzed within 40 days, soils and water.

ACTION:

- 1. If holding times are exceeded all positive results are estimate (J) and non-detects are estimated (UJ).
- 2. If holding times are grossly exceeded, the reviewer may determine that non-detects are unusable (*).

ORGANIC DATA

Project Name	::Barnes Building	No. of Samples: _4 Aqueous, 3 Air
Project Locat	ion: Boston, M4	Aqueous, Air
		Matrix:
Project No.	PS-029471	Reviewer: Kestrel Environmental Tech.
Contact No.	500024	Reviewer's Name: Deborah Smith
Laboratory:	Mitkem Corp., Lancaster Laboratories	Completion Date 02:20:97

DATA ASSESSMENT SUMMARY

		TO14	VOA	Pest	- 944
1.	Chain of Custody	X	X	X	-
2.	Sample Log-in Documents	X	X	A^{r}	
3.	Field Rinsate Blanks	NA	NA	NA	
4.	Trip Blanks	NA NA	A	NA	
5.	Method Blanks	A	А	А	
6.	MS/MSD	NA	Z	Z	
7.	LCS/LCSD	NA	Z	Z	
8.	Lab Duplicates	NA	M	A	
9.	Surrogate Recoveries	NA	Z	A	
10.		NA	$X = \frac{1}{2}$	M	
11.	Overall Assessment	A	M	M	

- A = Accept all data without qualification. No problems encountered.
- M = Data qualified due to major problems.
- Z = Data unacceptable.
- X =Problems, but do not affect data.

Action Items: VOA data qualified due to LCS recoveries and sample duplicate precision results. No data qualifications are recommended for the TO14 data. It is recommended to qualify the 8081 data due to LCS recoveries and exceedance of extraction holding times.

Areas of Concern: Mitkem did not note whether or not they checked the preservation of VOA vials immediately prior to analysis. The entire analyte list was not spiked into the LCS or MS/MSD (both 82604 and 8081), as is required by the USACE. Laboratory derived limits were not provided in the data package as is required by the USACE. Method 8260A and the USACE methods compendium requires the use of four surrogates for method 8260A; Mitkem only used three

Notable Performance:

MASSACHUSETTS DEP EXTRACTABLE PETROLEUM HYDROCARBONS ANALYSIS (KESTREL)

February 26, 1997

Mr. Kevin Scully: Stone & Webster Environmental Technology & Services 245 Summer Street Boston, MA 02210

RE: Contract/Work Assignment #:DACW33-94-D-0007

Data Validation Letter Report, J.O.# 05000.24 Stone & Webster Subcontract #: PS-029471

Lab Name: Mitkem, Warwick R.L. Site Name: Barnes Building Project.

Mass DEP EPH

Samples Collected: 4water samples analyzed for Mass DEP EPH Draft 1.0

1SW2X collected 12/12/96 1SW2XD collected 12/12/96 1SW1X collected 12/12/96

Dear Mr. Scully:

The requirements of this data validation are specified in the 16 August 1989 memorandum from CEMRD-ED-GC. This data validation was performed on Mass DEP EPH analytical data from samples collected by Stone and Webster at the Barnes Building Project Site. The laboratory, Mitkem. (Warwick R.I), prepared and analyzed the samples in accordance with Mass DEP EPH methods for extractable petroleum hydrocarbons. The data were evaluated based on the following parameters in accordance with project specific guidelines and standard USEPA data validation guidelines:

Chain of custody documents Sample log-in documents

*Trip blanks, field blanks, and method blanks

MS/MSD results

- *LCS/LCSD results
- *Field duplicate results
- *Laboratory duplicate results
- *Surrogate Recoveries
- *Holding Times
- * All criteria were met for these parameters.

Chain of Custody and Sample Log In Documents

Laboratory cooler receipt documentation was in order. The laboratory should record the actual sample pHs upon sample receipt. According to the sample log in documentation sample preservatives were present in the samples.

Matrix Spike/Matrix Spike Duplicate Results

MS/MSD recoveries for the C19-C36 aliphatic fraction and chrysene are below the method specified acceptance level (60%). The C19-C36 aliphatic results are qualified estimated(J). The chrysene results are qualified as (UJ); undetected estimated.

Summary

A summary of the above findings as well as additional comments not previously addressed in this memorandum are included in this summary section.

The MS/MSD recoveries for the C19-C36 aliphatic fraction and chrysene are below the method specified acceptance level (60%). The C19-C36 aliphatic results are qualified estimated(J). The chrysene results are qualified as (UJ); undetected estimated.

Instrument run logs were not included in this package, therefore it is impossible to determine the frequency of blank and calibration analyses. It is also impossible to determine the number of samples analyzed within an analytical sequence.

Table I summarizes the validated sample results for the Barnes Building Project. The Mass DEP EPH data review worksheets are appended to this package.

Sincerely,

Kestrel Environmental Technologies, Inc.

What PSNE

Deborah L. Smith

President

Barnes Building Project Mass DEP EPH Recommendations Summary

Sample	EPH
ISW2X	A ¹
1SW2D	\mathbf{A}^1
1SW1X	A¹

A¹ - Accept all data (the C19-C36 fraction is estimated (J) due to low MS/MSD recoveries. Chrysene results are qualified as undetected estimated (UJ) due to low MS/MSD recoveries.)

Table I

Mass DEP EPH Validated Results

Project #:

J.O. #: 5000.24

Site: Barnes Building Project

S&W Sample Number:	1SW2X	1SW2D	1SW1X		
Lab Sample Number:	C1515-01	C1515-02	C1515-03		
Matrix/Analysis:	Water	Water	Water	i	
Sample Type:	Grab	Grab	Grab	;	
Dilution Factor:	1	1	10	1	
Date Sampled:	12/12/96	12/12/96	12/12/96		
Date Extracted:	12/17/96	12/17/96	12/17/96		
Date Analyzed	12/24&28/96	12/24&28/96	12/24&28/96	!	
Percent Moisture:	0.0	0.0	0.0	Report Limits	
	ug/L	ug/L	ug/L	ug/L	
C9-C18 Aliphatics	2100	2100	97000	30	
C19-C36 Aliphatics	350J	360J	20000J	40	
C10-C22 Aromatics	920	1000	26000	85	
,					
Total EPH	1000	1200	31000	İ	
Acenaphthene	5U	5U	50U	5U	
Acenaphthylene	5U	5U	50U	5 U	
Anthracene	5U	5 U	50U	5U	
Benzo(a)anthracene	5U	5 U	50U	5U	
Benzo(a)pyrene	5U	5 U	50U	5U	
Benzo(b)fluoranthene	5U	5 U	50U	5U	
Benzo(ghi)perylene	5U	5U	50U	5U	
Benzo(k)fluoranthene	5U -	5 U	50U	5U	
Chrysene	5UJ	5UJ	50UJ	5U	
Dibenzo(a.h)anthracene	5U	5 U	50U	- 5U	
Fluoranthene	5U	5 U	50U	5U	
Fluorene	5U	5U	50U	5U	
Indeno(1.2.3-cd)pyrene	5U	5U	50U	5U	
Naphthalene	5U	5U	50U	5U	 -
Phenanthrene	5 U	5U	50U	5U	
Pyrene	5U	5U	50U	5U	
2-Methylnaphthalene	5U	5U	50U	5U	
Chlorooctadecane (surr)%	96%	99%	DIL	<u> </u>	
Ciliorocciadecane isur i%	, , , ,	2 / / W	1711	!	

J - The associated numerical value is an estimated quantity.

U - The compound was not detected. The associated numerical value is the compound quantitation limit.

UJ - The compound was not detected. The compound quantitation limit is an estimated value.

R - The datum was rejected.

DATA REVIEW WORKSHEETS

Project Name: Barnes Build		I.O. <u>05000.24</u>				
Location: Massachusetts Contract Number PS-029471						
	REVIEW OF MAD DATA PAG					
The hardcopied (laboratory name has been reviewed and the Qualincluded:	·	Mitkem erformance data sumn	data package narized. The data review			
Reviewer: Kestrel Environm Technologies, Inc	. Samplin	g Date(s) 12/12/96				
Validator: D.L. Smith		Date(s) 12/12/96				
No. of Samples/Matrix 3 W	Vater 1	Date Rec'd by LabI	12/13/96			
Sample Identifiers:						
ISW2X	1SW2D	1SW1X				
	_					
The methods reviewed in this put the general criteria used to de	oackage are: Mass	DEP EPH Draft 1.0.	on an examination of:			
 Chain of Custody Sample Log-in Doce Field Rinsate Blanks Trip Blanks Method Blanks 	- : : : : : : : : : : : : : : : : : : :	Matrix Spike Blank Spikes (LCS/L0 Laboratory Duplicates Field Sample Duplica Surrogate Recoveries Holding Times	s tes			
Overall Comments: C19-C36 due to low MS/MSD recover			d J and UJ respectively,			
Definitions and Qualifiers:						
A - Acceptable data. J - Approximate data due to R - Reject data due to quality U - Analyte not detected. Reviewer:	•	ia.	Date: 2/26/97-			

I. CHAIN OF CUSTODY AND SAMPLE LOG-IN DOCUMENTS

Are all samples identified on the chain of custody?	YES	NO
Are sample dates and appropriate signatures present?	YES	NO
Were the samples containers intact?	YES	NO
Were the samples preserved according to protocol?	YES	NO
Were custody seals present and intact?	YES	NO
Were the samples clearly and accurately labeled?	YES	NO

Explain any deviations: Chain of custod

Chain of custody forms indicate that sample preservatives were added to appropriate sample containers. Sample log in forms do not indicate that the sample pHs were checked for the EPH samples. This should be a routine practice.

II A. BLANK ANALYSIS RESULTS (Section 1-3)

List the blank contamination in Sections 1 & 2 below. A separate worksheet should be used for soil and water blanks.

I. Laboratory Blanks	Matrix:	Water

Date	ICB/CCB#	Prep BL	Analyte	Conc./Units
			<u> </u>	
			<u>. </u>	
				ļ
			<u> </u>	
• • •				
			-	

2. Equipment/Trip Blanks

Matrix:	Water
---------	-------

Date	Equipment Blank No.	Analyte	Conc./Units
		<u> </u>	
· =··			
		<u>.</u> . <u>.</u>	
		. =	
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··· 		·	
	-		-

3. Frequency Requirements

A. Was a preparation blank analyzed for each matrix, for every 20 samples			
and for each batch?	Yes	or	No
B.W. 19 2 11 1			

B. Was a calibration blank run every 10 samples. *Unknown, insufficient documentation.*

Yes or No

If No.

The data may be affected. Use professional judgment to determine the severity of the effect and qualify the data accordingly. Discuss any actions below, and list the samples affected.

No actions required.

II B. BLANK ANALYSIS RESULTS (Section 4)

4. Blank Actions

The Action Levels for any analyte is equal to five times the highest concentration of that analyte's contamination in any blank. The action level for samples which have been concentrated or diluted should be multiplied by the concentration/dilution factor. No positive sample result should be reported unless the concentration of the analyte in the sample exceeds the Action Level (AL). Specific actions are as follows:

- 1. When the concentration is greater than the IDL, but less than the Action Level, report the sample concentration detected with a U.
- 2. When the sample concentration is greater than the Action Level, report the sample concentration unqualified.

Matrix:	Soil			Matrix: A	queous
Analyte	Max. Conc./ Units	AL/ Units	Analyte	Max. Conc./ Units	AL/ Units

NOTE: Blanks analyzed during a soil case must be converted to mg/kg in order to compare them with the sample results.

Conc. in μ g/L x Volume diluted to (mls) x 1L x 1000gm x 1mg = mg/kg Weight digested (gm) 1000ml 1kg 1000 μ g

Multiplying this result by 5 to arrive at the action level gives a final result in mg/kg which can then be compared to sample results.

III. MATRIX SPIK	HI.	11. P	VLΑ		XL.	Λ.	511	1/1
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Sample ID ISW2XMS	Matrix:	Water
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Recovery Criteria Method Acceptance Criteria: 60-140%

List the percent recoveries for analytes which did not meet the required criteria.

S - amount of spike added (not reported)

SSR - spikes sample result (not reported)

SR - sample result

Analyte	SSR	SR	S	%R	Action
C19-C36		350ug/L		31%	J
Aliphatic					
Chrysene		5U		48%	UJ

Matrix Spike Actions apply to all samples of the same matrix.

ACTIONS:

- 1. If the sample concentration exceeds the spike concentration by a factor of 4 or more, no action is taken.
- 2. If any analyte does not meet the %R criteria follow the actions stated below:

	Percent Recovery			
	< 30%	30%-59%	>140%	
Positive Sample Results	J	J	J	
Non-detected Results	R	UJ	Α	

- 2. Frequency Criteria
 - A. Was a matrix spike prepared at the required frequency? Yes or
 - B. Was a post digestion spike analyzed for elements that did not meet required criteria for matrix spike recovery? *Not applicable.* Yes or No

A separate worksheet should be used for each matrix spike pair.

No

III.	MATRIX	SPIKE	DUPL	ICATE
------	--------	--------------	------	--------------

Sample ID ISW2XMSD	Matrix:	Water
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Recovery Criteria Method Acceptance Criteria: 60-140%

List the percent recoveries for analytes which did not meet the required criteria.

S - amount of spike added (not reported)

SSR - spikes sample result (not reported)

SR - sample result

Analyte	SSR	SR	S	%R	Action
C9-C36 Aliphatics		350ug/L		31	J
Aliphatics					
Chrysene		5 <i>U</i>		50	UJ

Matrix Spike Actions apply to all samples of the same matrix.

ACTIONS:

- 1. If the sample concentration exceeds the spike concentration by a factor of 4 or more, no action is taken.
- 2. If any analyte does not meet the %R criteria follow the actions stated below:

	Percent Recovery				
	< 30%	30%-59%	>140%		
Positive Sample Results	J	J	J		
Non-detected Results	R	UJ	Α		
2. Frequency Criteria					
A. Was a matrix spike prepa	red at the required fre	quency?	Yes or No		

B. Was a post digestion spike analyzed for elements that did not meet required criteria for matrix spike recovery? *Not applicable.* Yes or No

A separate worksheet should be used for each matrix spike pair.

IV. LABORATORY CONTROL SAMPLE

(ALL CRITERIA MET.)

1. Aqueous LCS Method Acceptance Criteria 60-140% Recovery.

List any LCS recoveries not within the 80-120% criteria and the samples affected.

Date	Analyte	%R	Action	Samples Affected
		:		

2. Solids LCS None Analyzed

List any analytes that were not within the control windows set by the EPA for the solid LCS sample. The 80-120% criteria is not used to evaluate solid LCS results.

Analyte	LCS Conc.	Control Windows	Action	Samples Affected
	 .			
1				

ACTIONS:

Percent Recovery			
<30%	30%-59%	>140%	
R	J	J	
R	UJ	A	
	<30% R R		

Solid LCS	<pre>_<epa control="" pre="" windows<=""></epa></pre>	>EPA Control Windows
Positive Results	T	
Positive Results	J	j
Non-detected Results	UJ	Α

3. Frequency Criteria

A. Was an LCS analyzed for every matrix, every prep batch, every 20 samples?

Yes	or	No

VIII. LABORATORY DUPLICATES (ALL CRITERIA MET)

List the concentrations of all analytes in the laboratory duplicate pair. Indicate what criteria was used to evaluate the precision by circling either the RPD or reporting limit for each analyte.

				Ma	trix:	Water
	Reportin	g Limits		······		-
	Water	Soil	Sample #	Duplicate #		
Analyte	ug/L	mg/kg	1SW2XMS	ISW2XMSD	RPD	Action
C9-C18 Ali	30		74%	64%	14	none
C19-C36 Ali	40		31%	31%	0	none
C10-C22	85		75%	78%	4	none
acenaphthene	5		79%	88%	11	none
Anthracene	5		93%	98%	5	none
Chrysene	5		48%	50%	4	none
Naphthalene	5		68%	74%	8	none
Pyrene	5		86%	81%	6	none
		1				

Laboratory duplicate actions should be applied to all other samples of the same matrix type.

ACTIONS:

- 1. Estimate (J) positive results for analytes which have an RPD >25% for waters.
- 2. If sample results are less than 5x the reporting limit, estimate (J) positive results for analytes whose absolute difference is > reporting limit, (2x reporting limit for soils). If both samples are non-detected, the RPD is not calculated (NC).

IX. FIELD DUPLICATES

(ALL CRITERIA MET)

Matrix:

Water

List the concentrations of all analytes in the field duplicate pair. Indicate what criteria was used to evaluate the precision by circling either the RPD or reporting limit for each analyte.

				ivia	нгіх: ——	water
	Reportir	g Limits	-			
	Water	Soil	Sample #	Duplicate #		
Analyte	ug/L	mg/kg	1SW2X	ISW2D	RPD	Action
C9-C18 Ali	30		2100	2100	0	none
C19-C36 Ali	40		350	360	20	
C19-C30 All	40		330	300	2.8	none
C10-C22 Aro	85		920	1000	8.3	none
Acenaphthene	5		5 <i>U</i>	5U	NC	none
Acenaphthyle	5		5U	5U	NC	none
Anthracene	5		5U	5U	NC	none
Benzo(a)anthr	5		5U	5U	NC	попе
Benzo(a)pyre	5		5U	5U	NC	none
Benzo(b)fluor	5		5U	5U	NC	none
Benzo(gh)per	5		5U	5U	NC	none
Benzo(k)fluor	5		5U	5 <i>U</i>	NC	none
Chrysene	5		5Ü	5U	NC	none
Dibenzo(a,h)	5		5U	5 <i>U</i>	NC	none
Fluoranthene	5		5U	5U	NC	none
Fluorene	5		5U	5U	NC	none
Indeno(1,2,3-	5		5U	5U	NC	none
Naphthalene	5		5U	5Ü	NC	none
Phenanthrene	5		5U	5U	NC	none
Pyrene	5		5U	5U	NC	none
2-Methylnaph	5		5U	5U	NC	none

Field Duplicate Actions should be applied to all other samples of the same matrix type.

ACTIONS:None

Estimate (J) positive results for elements which have an RPD >25% for waters. If sample results are less than 5x the reporting limit, estimate (J) positive results for elements whose absolute difference is >2x reporting limit, (4x reporting limit for soils). If both samples are non-detected, the RPD is not calculated (NC).

X SURROGATE SPIKE RECOVERIES

(ALL CRITERIA MET)

List the percent recoveries which do not meet the surrogate recovery criteria.

Matrix: Water

	ЕРН		Action
Sample IDs			
<u> </u>			
			
	·		
•			
			
QC Limits	60		
	to		
	140		

	PERCENT RECOVERY			
	<10%	10%-59%	60%-140%	>140%
Positive sample results	J	J	Α	J
Non-detected results	R	UJ	Α	Α

XI. HOLDING TIMES

Complete table for all samples and circle the analysis data for samples not within criteria.

		EPH	EPH		p	Н	
Sample ID	Date Sampled	Extraction Date	Analysis Date		EPH		Action
1SW2X	12/12/96	12/17/96	12/20&28	NA	<2	NA	None
ISW2D	12/12/96	12/17/96	12/20&28	NA	<2	NA	None
1SW1X	12/12/96	12/17/96	12/20&28	NA	<2	NA	None
							-

EPH (Extraction time 7 days from collection)

ACTION:

- 1. If holding times are exceeded all positive results are estimated (J) and non-detects are estimated (UJ).
- 2. If holding times are grossly exceeded, the reviewer may determine that non-detects are unusable (R).

Mass DEP EPH DATA ASSESSMENT

Project Name: Barnes Building Project	No. of Samples: 3
Project Location: Massachusetts	Matrix: Water
Stone & Webster Subcontract #: J.O#05000.24	Reviewer: Kestrel Env. Tech., Inc.
Contact No. DACW-33-94-D-0007	Reviewer's Name: D.L. Smith
Laboratory: Mitkem	Completion Date 02/27/97

BARNES BUILDING PROJECT DATA ASSESSMENT SUMMARY

		EPH		
1.	Holding Times	A		
2.	Blanks	A		
3.	LCS	A		
4.	Duplicate Analysis	A		
5.	Matrix Spike	N		
6.	Surrogate recovery	A		
7.	Other QC	A		
8.	Overall	A		
	Assessment			

- A = Accept all data without qualification. No problems encountered.
- N = Data qualified due to minor problems.
- M = Data qualified due to major problems.
- Z = Data unacceptable.
- X = Problems, but do not affect data.

Actions Items: C19-C36 aliphatic MS/MSD recoveries and chrysene MS/MSD recoveries are outside the method QC limit. All recoveries are low. The C19-C36 fraction is estimated J. Chrysene is estimated UJ. The C19-C36 fraction is not a significant contributor to the Total EPH concentration, therefore the Total EPH results are accepted without qualification.

Areas of Concern:. Instrument run logs not submitted. The sample pHs are not confirmed at the time of sample receipt. The LCS/LCSD and MS/MSD spiking levels are not reported.

MASSACHUSETTS DEP VOLATILE PETROLEUM HYDROCARBONS ANALYSIS (KESTREL)

February 26, 1997

Mr. Kevin Scully: Stone & Webster Environmental Technology & Services 245 Summer Street Boston, MA 02210

RE: Contract/Work Assignment #:DACW33-94-D-0007

Data Validation Letter Report, J.O.# 05000.24 Stone & Webster Subcontract #: PS-029471

Lab Name: Mitkem, Warwick R.I.. Site Name: Barnes Building Project.

Mass DEP VPH

Samples Collected: 4water samples analyzed for Mass DEP VPH Draft 1.0

1SW2X collected 12/12/96 1SW2XD collected 12/12/96 1SW1X collected 12/12/96 Trip Blank collected 12/12/96

Dear Mr. Scully:

The requirements of this data validation are specified in the 16 August 1989 memorandum from CEMRD-ED-GC. This data validation was performed on Mass DEP VPH analytical data from samples collected by Stone and Webster at the Barnes Building Project Site. The laboratory, Mitkem, (Warwick R.I), prepared and analyzed the samples in accordance with Mass DEP VPH methods for volatile petroleum hydrocarbons. The data were evaluated based on the following parameters in accordance with project specific guidelines and standard USEPA data validation guidelines:

Chain of custody documents
Sample log-in documents
Trip blanks, field blanks, and method blanks

- *MS/MSD results
- *LCS/LCSD results
- *Field duplicate results
- *Laboratory duplicate results
- *Surrogate Recoveries
- *Holding Times
- * All criteria were met for these parameters.

Chain of Custody and Sample Log In Documents

Laboratory cooler receipt documentation was in order. The laboratory should record the actual sample pHs upon sample receipt. According to the sample log in documentation sample preservatives were present in the samples.

Trip Blanks, Field Blanks, and Method Blanks

Analysis of the trip blank indicates random contamination for the C9-C10 aromatic fraction (35ug/L). This result also impacts the total VPH concentration as determined by the TPH calculation, where total VPH is the sum of weighted factors for the C5-C8 aliphatics, the C9-C12 aliphatics and the C9-C10 aromatic fraction. The C9-C10 aromatic fraction reporting limit and the total VPH reporting limit were raised to 175ug/L due to the trip blank results.

Summary

A summary of the above findings as well as additional comments not previously addressed in this memorandum are included in this summary section.

The reporting limits for the C9-C10 aromatic fraction and the total VPH result are raised to 175ug/L due to C9-C10 blank contamination in the trip blank.

Instrument run logs were not included in this package, therefore it is impossible to determine the frequency of blank and calibration analyses. It is also impossible to determine the number of samples analyzed within an analytical sequence.

Table 1 summarizes the validated sample results for the Barnes Building Project. The Mass DEP VPH data review worksheets are appended to this package.

Sincerely,

Kestrel Environmental Technologies, Inc.

all & Sux

Deborah L. Smith

President

Barnes Building Project Mass DEP VPH Recommendations Summary

Sample	VPH
1SW2X	A
1SW2D	A
ISW1X	A
Trip Blank	A

A - Accept all data (the C9-C10 aromatic fraction and total VPH reporting limits are elevated to 175ug/L due to trip blank contamination).

Table I

Mass DEP VPH Validated Results

Project #:

J.O. #: 5000.24

Site: Barnes Building Project

S&W Sample Number:	1SW2X	1SW2D	1SW1X	TRIP BLANK	
Lab Sample Number:	C1515-01	C1515-02	C1515-03	C1515-04	l
Matrix/Analysis:	Water	Water	Water	Water	
Sample Type:	Grab	Grab	Grab		
Dilution Factor:	1	1	1	1	
Date Sampled:	12/12/96	12/12/96	12/12/96	12/12/96	
Date Extracted:					
Date Analyzed	12/24/96	12/24/96	12/24/96	12/24/96	
Percent Moisture:	0.0	0.0	0.0	0.0	Report Limits
	ug/L	ug/L	ug/L	ug/L	ug/L
C5-C8 Aliphatics	75U	75 U	75 U	75U	75
C9-C12 Aliphatics	190	160	280	65U	65
C9-C10 Aromatics	175U	175U	1 75 U	175U	20
Total VPH	175U	175U	1 7 5U	175U	
MTBE	5 U	5U	5 U	5U	5
Benzene	5U	5U	5U	5U	5
Toluene	15	16	5U	5U	5
Ethylbenzene	5U	5U	5 U	5U	5
m,p-Xylenes	5U	5U	5U	5U	5
o-Xylene	5U	5U	5U	5U	5
Naphthalene	5	5	6	5U	5
2.5-Dibromotoluene (surr)	103%	118%	114%	121%	
		i			

J - The associated numerical value is an estimated quantity.

U - The compound was not detected. The associated numerical value is the compound quantitation limit.

UJ - The compound was not detected. The compound quantitation limit is an estimated value.

R - The datum was rejected.

DATA REVIEW WORKSHEETS

Project Name: Barnes Build Location: Massachusetts		O. 05000.24 per PS-029471			
REVIEW OF MASS DEP VPH DATA PACKAGE					
The hardcopied (laboratory na has been reviewed and the Quaincluded:		Mitkem formance data summa	data package nrized. The data review		
Reviewer Kestrel Environme Technologies, Inc. Validator: D.L. Smith No. of Samples/Matrix 4 W	Sampling D Shipping D	Pate(s) 12/12/96 Pate(s) 12/12/96 Pate Rec'd by Lab 12	2/13/96		
Sample Identifiers: 1SW2X	1SW2D	ISWIX	Trip Blank		
The methods reviewed in this The general criteria used to d - Chain of Custody - Sample Log-in Doc - Field Rinsate Blank - Trip Blanks - Method Blanks	etermine system perfo - N uments - B s - L - F - S - I	Matrix Spike Hank Spikes (LCS/LC) aboratory Duplicates ield Sample Duplicate urrogate Recoveries Holding Times	SD) es		
Overall Comments: Trip blan Results less than 175 ug/L are r fraction result and the total V reporting limit is 175 ug/L for the Definitions and Qualifiers:	reported as undetected for PH calculation, all total	or the C9-C10 fraction.	Based upon the aromatic		
A - Acceptable data. J - Approximate data due to R - Reject data due to quality U - Analyte not detected. Reviewer:	•	a.	Date: 2/26/97		

I. CHAIN OF CUSTODY AND SAMPLE LOG-IN DOCUMENTS

Are all samples identified on the chain of custody?	YES	NO .
Are sample dates and appropriate signatures present?	YES	NO
Were the samples containers intact?	YES	NO
Were the samples preserved according to protocol?	YES	NO
Were custody seals present and intact?	YES	NO
Were the samples clearly and accurately labeled?	YES	NO

Explain any deviations:

Chain of custody forms indicate that sample preservatives were added to appropriate sample containers. Sample log in forms do not indicate that the sample pHs were checked for the VPH samples. This should be a routine practice.

II A. BLANK ANALYSIS RESULTS (Section 1-3)

List the blank contamination in Sections 1 & 2 below. A separate worksheet should be used for soil and water blanks.

1. Laboratory Bla	nks	Matrix:	Water	
Date	ICB/CCB#	Prep BL	Analyte	Conc./Units
				<u> </u>
			 	
			 	
		<u> </u>	<u>. </u>	<u> </u>
			 	
				

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,	-am	nment	' I TID	Rian	ĽC
∠.	Lyui	21110116	TIL	Dian.	

Date	Equipment Blank No.	Analyte	Conc./Units
12/24/96	Trip Blank	C9-C10 Aromatics	35 ug/L
	· · · · · · · · · · · · · · · · · · ·		
	·	-	
			

3. Frequency Requirements

A. Was a preparation blank analyzed for each matrix, for every 20 samples			
and for each batch?	Yes	ог	No
B. Was a calibration blank run every 10 samples.			
Unknown, insufficient documentation.	Yes	or	No

If No.

The data may be affected. Use professional judgment to determine the severity of the effect and qualify the data accordingly. Discuss any actions below, and list the samples affected.

No i	action	requ	irea.
------	--------	------	-------

Matrix:

Water

II B. BLANK ANALYSIS RESULTS (Section 4)

4. Blank Actions

The Action Levels for any analyte is equal to five times the highest concentration of that analyte's contamination in any blank. The action level for samples which have been concentrated or diluted should be multiplied by the concentration/dilution factor. No positive sample result should be reported unless the concentration of the analyte in the sample exceeds the Action Level (AL). Specific actions are as follows:

- 1. When the concentration is greater than the IDL, but less than the Action Level, report the sample concentration detected with a U.
- 2. When the sample concentration is greater than the Action Level, report the sample concentration unqualified.

Matrix:	Soil	Matrix: Aqueous	
			_

Analyte	Max. Conc./ Units	AL/ Units
		-

Analyte	Max. Conc./ Units	AL/ Units
C9-C10 Aromatics	35 ug/l	175 ug/L

NOTE: Blanks analyzed during a soil case must be converted to mg/kg in order to compare them with the sample results.

Conc. in
$$\mu$$
g/L x Volume diluted to (mls) x 1L x 1000gm x 1mg = mg/kg Weight digested (gm) 1000ml 1kg 1000 μ g

Multiplying this result by 5 to arrive at the action level gives a final result in mg/kg which can then be compared to sample results.

III.	MATRIX	SPIKE	(All criteria met)	ı
------	--------	-------	--------------------	---

Sample ID <u>ISW2XMS</u> Matrix: <u>Water</u>

Recovery Criteria Method Acceptance Criteria:80-120% (All criteria met)

List the percent recoveries for analytes which did not meet the required criteria.

S - amount of spike added (not reported)

SSR - spikes sample result (not reported)

SR - sample result

SSR	SR	S	%R	Action
	SSR	SSR SR	SSR SR S	SSR SR S %R

Matrix Spike Actions apply to all samples of the same matrix.

ACTIONS:

- 1. If the sample concentration exceeds the spike concentration by a factor of 4 or more, no action is taken.
- 2. If any analyte does not meet the %R criteria follow the actions stated below:

		Percent Recovery	
	< 30%	30% - 79%	> 120%
Positive Sample Results	J	j	J
Non-detected Results	R	UJ	Α

- 2. Frequency Criteria
 - A. Was a matrix spike prepared at the required frequency?

Yes or No

B. Was a post digestion spike analyzed for elements that did not meet required criteria for matrix spike recovery? *Not applicable.*

Yes or No

A separate worksheet should be used for each matrix spike pair.

III.	MAT	`RIX	SPIKE	DUPL	JICA	TE
------	-----	------	-------	------	------	----

Sample ID	1SW2XMSD	Matrix:	Water
-----------	----------	---------	-------

Recovery Criteria Method Acceptance Criteria:80-120%

List the percent recoveries for analytes which did not meet the required criteria.(All criteria met)

S - amount of spike added (not reported)

SSR - spikes sample result (not reported)

SR - sample result

Analyte	SSR	SR	S	%R	Action
	· 	<u> </u>			

Matrix Spike Actions apply to all samples of the same matrix.

ACTIONS:

- 1. If the sample concentration exceeds the spike concentration by a factor of 4 or more, no action is taken.
- 2. If any analyte does not meet the %R criteria follow the actions stated below:

	Percent Recovery			
	< 30%	30% - 79%	> 120%	
Positive Sample Results	J	J	J	
Non-detected Results	R	UJ	A	

- 2. Frequency Criteria
 - A. Was a matrix spike prepared at the required frequency?

 Yes or No
 - B. Was a post digestion spike analyzed for elements that did not meet required criteria for matrix spike recovery? *Not applicable.* Yes or No

A separate worksheet should be used for each matrix spike pair.

IV. LABORATORY CONTROL SAMPLE

(ALL CRITERIA MET.)

1. Aqueous LCS Method Acceptance Criteria 80-120% Recovery.

List any LCS recoveries not within the 80-120% criteria and the samples affected.

Date	Analyte	%R	Action	Samples Affected
ļ. 				

2. Solids LCS None Analyzed

List any analytes that were not within the control windows set by the EPA for the solid LCS sample. The 80-120% criteria is not used to evaluate solid LCS results.

Analyte	LCS Conc.	Control Windows	Action	Samples Affected
	·			
				

ACTIONS:

		Percent Recovery	
Aqueous LCS	< 50%	50% - 79%	> 120%
Positive Results	R	J	J
Non-detected Results	R	UJ	Α

Solid LCS	<epa control="" th="" windows<=""><th>>EPA Control Windows</th></epa>	>EPA Control Windows
Positive Results	J	J
Non-detected Results	UJ	Α

3. Frequency Criteria

A. Was an LCS analyzed for every matrix, every prep batch, every 20 samples?

Yes	or	No
, 03	01	110

VIII. LABORATORY DUPLICATES

List the concentrations of all analytes in the laboratory duplicate pair. Indicate what criteria was used to evaluate the precision by circling either the RPD or reporting limit for each analyte.

				Ma	trix:	Water
	Reportin	g Limits				
	Water	Soil	Sample #	Duplicate #		
Analyte	ug/L	mg/kg	1SW2XMS	1SW2XMSD	RPD	Action
C5-C8 Aliph	75		83 %_	96 %	15	none
C9-C12 Aliph	65		102 %	119 %	15	none
C9-C10 Arom	20		101 %	119 %	16	none
MTBE	5		93 %	98 %	5	none
Benzene	5		98 %	106 %	8	none
Toluene	5_		103 %	112 %	8	none
Ethylbenzene	5		92 %	102 %	10	none
m,p-Xylene	5		96 %	106 %	10	none
o-Xylene	5		94 %	104 %	10	none
Naphthalene	5		103 %	110 %	7	none

Laboratory duplicate actions should be applied to all other samples of the same matrix type.

ACTIONS:1

- 1. Estimate (J) positive results for analytes which have an RPD >20% for waters and >20% for soils.
- 2. If sample results are less than 5x the reporting limit, estimate (J) positive results for analytes whose absolute difference is > reporting limit, (2x reporting limit for soils). If both samples are non-detected, the RPD is not calculated (NC).

IX. FIELD DUPLICATES

List the concentrations of all analytes in the field duplicate pair. Indicate what criteria was used to evaluate the precision by circling either the RPD or reporting limit for each analyte.

				N	latrix:	Water
	Reporting Limits					
Ī	Water	Soil	Sample #	Duplicate #		
Analyte	ug/L	mg/kg	ISW2X	ISW2D	RPD	Action
C5-C8 Aliph	75		75 <i>U</i>	75U	NC	none
C9-C12 Aliph	65		190	160	17.2	none
C9-C10 Arom	20		175U	175U	NC	none
MTBE	5		5 <i>U</i>	5 <i>U</i>	NC	none
Benzene	5		5U	5U	NC	none
Toluene	5		15	16	6.3	none
Ethylbenzene	5	Ţ	5U	5U	NC	none
m,p-Xylene	5		5U	5U	NC	none
o-Xylene	5		5U	5U	NC	none
Naphthalene	5		5	5	NC	none
Total VPH			175U	175U	NC	none

Field Duplicate Actions should be applied to all other samples of the same matrix type.

ACTIONS:None

1. Estimate (J) positive results for elements which have an RPD >20% for waters and >20% for soils.

If sample results are less than 5x the reporting limit, estimate (J) positive results for elements whose absolute difference is >2x reporting limit, (4x reporting limit for soils). If both samples are non-detected, the RPD is not calculated (NC).

X SURROGATE SPIKE RECOVERIES

List the percent recoveries which do not meet the surrogate recovery criteria.

Matrix: Water

	VPH	Action
Sample IDs	2.5-Dibromotoluene	
Trip Blank	121%	None
QC Limits	20	
QC Limits	80	
	to	
	120	

	PERCENT RECOVERY			
	<10%	<u>10%-79%</u>	80%-120%	>120%
Positive sample results	J	J	Α	J
Non-detected results	R	UJ	Α	Α

IX. HOLDING TIMES

Complete table for all samples and circle the analysis data for samples not within criteria.

-		VPH			pl	-l	
Sample ID	Date Sampled	Analysis Date			VPH		Action
ISW2X	12/12/96	12/24/96	NA	NA	<2	NA	None
1SW2D	12/12/96	12/24/96	NA	NA	<2	NA	None
1SW1X	12/12/96	12/24/96	NA	NA	<2	NA	None
Trip Blank	12/12/96	12/24/96	NA	NA	<2	NA	None
							
			<u> </u>				
	<u> </u>						
						•	
	 						
<u>, </u>							
 -	 	 					

VPH (holding time 14 days from collection)

ACTION:

- 1. If holding times are exceeded all positive results are estimated (J) and non-detects are estimated (UJ).
- 2. If holding times are grossly exceeded, the reviewer may determine that non-detects are unusable (R).

Mass DEP VPH DATA ASSESSMENT

Project Nam Barnes Building Project	No. of Samples: 4
Project Location: Massachusetts	Matrix: Water
Stone & Webster Subcontract #: J.O#05000.24	Reviewer: Kestrel Env. Tech., Inc.
Contact No. DACW-33-94-D-0007	Reviewer's Name: D.L. Smith
Laboratory: Mitkem	Completion Date 02/27/97

BARNES BUILDING PROJECT DATA ASSESSMENT SUMMARY

		VPH		
1.	Holding Times	A		
2.	Blanks	N		
3.	LCS	A		
4.	Duplicate Analysis	A		
5.	Matrix Spike	A		
6.	Surrogate recovery	A		
7.	Other QC	A		
8.	Overall	A		
	Assessment			

- A = Accept all data without qualification. No problems encountered.
- N = Data qualified due to minor problems.
- M = Data qualified due to major problems.
- Z = Data unacceptable.
- X = Problems, but do not affect data.

Actions Items: C9-C10 aromatic contamination detected in the trip blank at 35 ug/L. Total VPH results and C9-C10 aromatic results are adjusted to undetected at 175 ug/L.

Areas of Concern:. Instrument run logs not submitted. The sample pHs are not confirmed at the time of sample receipt. The LCS/LCSD and MS/MSD spiking levels are not reported.

OIL & GREASE AND TOTAL PETROLEUM HYDROCARBON ANALYSIS (KESTREL)

February 26, 1997

Mr. Kevin Scully: Stone & Webster Environmental Technology & Services 245 Summer Street Boston, MA 02210

RE: Contract/Work Assignment #:DACW-33-94-D-0007

Data Validation Letter Report, J.O.# 05000.24 Stone & Webster Subcontract #: PS-029471

Lab Name: Mitkem, Warwick R.I.. Site Name: Barnes Building Project.

413.1 & 418.1 Analysis

Samples Collected: 3 water samples analyzed for 413.1, (Oil & Grease) and 418.1 (TPH).

ISW2X collected 12/12/96 ISW2XD collected 12/12/96 ISW1X collected 10/31/96

Dear Mr. Scully:

The requirements of this data validation are specified in the 16 August 1989 memorandum from CEMRD-ED-GC. This data validation was performed on the 413.1 and 418.1 analytical data from samples collected by Stone and Webster at the Barnes Building Project Site.. The laboratory, Mitkem, (Warwick R.I), prepared and analyzed the samples in accordance with US EPA 413.1 methods for oil and grease, and method 418.1, TPH by IR spectroscopy. The data were evaluated based on the following parameters in accordance with project specific guidelines and standard USEPA data validation guidelines:

- Chain of custody documents
 Sample log-in documents
 Trip blanks, field blanks, and method blanks
 MS/MSD results
 LCS/LCSD results
 - *Field duplicate results
 - *Laboratory duplicate results
 - *Holding Times
- * All criteria were met for these parameters.

Chain of Custody and Sample Log In Documents

Laboratory cooler receipt documentation was in order. The laboratory should record the actual sample pHs upon sample receipt. According to the sample log in documentation sample preservatives were present in the samples.

Trip Blanks, Field Blanks, and Method Blanks

No equipment blank results were reported.

MS/MSD Results

No MS/MSD results reported for Method 413.1. Based upon 418.1 results and Mass VPH/EPH results data are not qualified. MS/MSD results for 418.1 are within criteria.

LCS/LCSD Results

No LCS/LCSD reported for 413.1 results. LCS reults for 418.1 is within criteria.

Summary

A summary of the above findings as well as additional comments not previously addressed in this memorandum are included in this summary section.

The results for the 413.1 analyses are qualified J (estimated) because a LCS result was not reported for the 413.1 analysis, and a MS/MSD was not analyzed with the 413.1 samples. The results are not rejected because the 418.1 results and the Massachusetts VPH/EPH results support the reported 413.1 data.

Instrument run logs were not included in this package, therefore it is impossible to determine the frequency of blank and calibration analyses. It is also impossible to determine the number of samples analyzed within an analytical sequence.

Table 1 summarizes the validated sample results for the Barnes Building Project. The 413.1 and 418.1 data review worksheets are appended to this package.

Sincerely,

Kestrel Environmental Technologies, Inc.

I libel P Cill

Deborah L. Smith

President

Barnes Building Project 413.1 & 418.1 Recommendations Summary

Sample	413.1	418.1
ISW2X	J	A
1SW2D	J	Α
1SW1X	J	A
**		

A - Accept all data.

J - Data are estimated

TABLE I

EPA 413.1 Oil Grease EPA 418.1 TPH

Project #: SDG:

J.O. #: 05000.24 Laboratory: Mitkem

Site: Barnes Building

S&W Sam	ple ID		18W2X	ISW2D	ISWIX		
Lab Sample N	umber:		C1515-01	C1515-02	C1515-03		
Sample Ty	pe:		Surface Water	Surface Water	Surface Water		
Matrix:			water	water	water		
Dilution Fa	ictor:						
Dilution Fa	ictor:						
Dilution Fa	ictor:						
Dilution Fa	ictor:						
Date Samp	led:		12/12/96	12/12/96	12/12/96		
Percent So	lids:		0,0	0.0	0.0		
Notes:							
	T						
Element	IDL	Method	mg/L	mg/L	mg/L		
Oil&Grease	1	413.1	41	6J	90J		
TPH	1	418.1	_6	7	250		
				<u> </u>	1	1	
	<u> </u>						
———	<u> </u>						
	 		-			-	
	 	-	····				
-	}	 - 			1		
<u> </u>						L	<u> </u>

Note:

- J Quantitation is approximate due to limitations identified in the quality control review (Date Review).
- U The compound was not detected. The associated numerical value is the compound quantitation limit.
- UJ The compound was not detected. The compound quantitation limit is an estimated value
- R Value is rejected.

DATA REVIEW WORKSHEETS

Project Name: Barnes Buildin Location: Massachusetts	<u></u>	O. 05000.24 per <i>PS-029471</i>	
REVIEW OF 413.1 & 418.1 DATA PACKAGE			
The hardcopied (laboratory name has been reviewed and the Quali included:		Mitkem formance data summar	data package ized. The data review
Reviewer: Kestrel Environmental Technologies, Inc. Sampling Date(s) 12/12/96 Validator: D.L. Smith Shipping Date(s) 12/12/96			
No. of Samples/Matrix 3 Wa			2/13/96
· · · · · · · · · · · · · · · · · · ·			
Sample Identifiers:		·	
1SW2X	ISW2D	1SW1X	
		<u> </u>	<u> </u>
Field Dup Nos.: ISW2X and ISW2D			
The methods reviewed in this package are: <u>US EPA 413.1 OIL & GREASE and 418.1 TPH.</u>			
The general criteria used to determine system performance were based on an examination of:			
- Chain of Custody - Matrix Spike			
- Sample Log-in Documents - Blank Spikes (LCS/LCSD)			
- Field Rinsate Blanks - Laboratory Duplicates			
- Trip Blanks - Field Sample Duplicates			
- Method Blanks - Holding Times			
Overall Comments: LCS and MS The sample pHs are not recorded			ogs not submitted.
Definitions and Qualifiers:			
A - Acceptable data.			
J - Approximate data due to quality control criteria.			
R - Reject data due to quality control criteria.			
U - Analyte not detected.			
Reviewer: Mull ?	PSI		Date: $\frac{2}{26}/97$

I. CHAIN OF CUSTODY AND SAMPLE LOG-IN DOCUMENTS

Are all samples identified on the chain of custody?	YES	NO
Are sample dates and appropriate signatures present?	YES	NO
Were the samples containers intact?	YES	NO
Were the samples preserved according to protocol?	YES	NO
Were custody seals present and intact?	YES	NO
Were the samples clearly and accurately labeled?	YES	NO

Explain any deviations:

Chain of custody forms indicate that sample preservatives were added to appropriate sample containers. Sample receipt forms do not indicate that the sample pHs were checked for the 413.1 and 418.1 samples. This should be a routine practice.

II A. BLANK ANALYSIS RESULTS (Section 1-3)

List the blank contamination in Sections 1 & 2 below. A separate worksheet should be used for soil and water blanks.

1. Laboratory Blanks	Matrix:	Water

Date	ICB/CCB#	Prep BL	Analyte	Conc./Units
			-	
			,	
			-	
				=
	<u></u>			
	 			
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	L	<u> </u>	<u> </u>	l

2	Equipment/Trip	Blanke .	(Nlono)	cubmitted	ļ
۷٠	Equipment Hip	Dimins	THUME	эистинси,	,

Date	Equipment Blank No.	Analyte	Conc./Unit
·			
• •			
			
			ļ
		<u>-</u>	

3. Frequency Requirements

A. Was a preparation blank analyzed for each matrix, for every 20 sample	es,		
and for each batch?	Yes	or	No

B. Was a calibration blank run every 10 samples or every 2 hours which ever is more frequent? Not applicable. Yes or No

If No.

The data may be affected. Use professional judgment to determine the severity of the effect and qualify the data accordingly. Discuss any actions below, and list the samples affected.

No actions required.

Water

Matrix:

II B. BLANK ANALYSIS RESULTS (Section 4)

4. Blank Actions

The Action Levels for any analyte is equal to five times the highest concentration of that element's contamination in any blank. The action level for samples which have been concentrated or diluted should be multiplied by the concentration/dilution factor. No positive sample result should be reported unless the concentration of the analyte in the sample exceeds the Action Level (AL). Specific actions are as follows:

- 1. When the concentration is greater than the IDL, but less than the Action Level, report the sample concentration detected with a U.
- 2. When the sample concentration is greater than the Action Level, report the sample concentration unqualified.

Matrix:	Soil	Matrix:	Aqueous

Element	Max. Conc./ Units	AL/ Units

Element	Max. Conc./ Units	AL/ Units

NOTE: Blanks analyzed during a soil case must be converted to mg/kg in order to compare them with the sample results.

Conc. in
$$\mu$$
g/L x Volume diluted to (mls) x 1L x 1000gm x 1mg = mg/kg Weight digested (gm) 1000ml 1kg 1000 μ g

Multiplying this result by 5 to arrive at the action level gives a final result in mg/kg which can then be compared to sample results.

1. Recovery Criteria Laboratory Acceptance Criteria: 70-130%

1SW2XMS for 418.1

List the percent recoveries for analytes which did not meet the required criteria.

S - amount of spike added SSR - spikes sample result SR - sample result

Sample ID

Analyte	SSR	SR	S	%R	Action
None					

Matrix Spike Actions apply to all samples of the same matrix.

ACTIONS:

- 1. If the sample concentration exceeds the spike concentration by a factor of 4 or more, no action is taken.
- 2. If any analyte does not meet the %R criteria follow the actions stated below:

		Percent Recovery	
	< 30%	30% - 69%	> 130%
Positive Sample Results	j	J	J
Non-detected Results	R	UJ	A

2. Frequency Criteria

A. Was a matrix spike prepared at the required frequency? Yes or No

B. Was a post digestion spike analyzed for elements that did not meet required criteria for matrix spike recovery? *Not applicable.* Yes or No

A separate worksheet should be used for each matrix spike pair.

Water

Matrix:

111	A 4 A TED LAZ	CDIZE	DUDI ICATE	/ X I	1.700	ſ	417	
ш.	MATKIX	2LIVE	DUPLICATE	(IVO)	WSD_{\cdot}	jor-	413.	1)

Sample ID ISW2XMSD Matrix:	Water
----------------------------	-------

Recovery Criteria Laboratory Acceptance Criteria 70-130%

List the percent recoveries for analytes which did not meet the required criteria.

S - amount of spike added not reported

SSR - spikes sample result not reported

SR - sample result

Analyte	SSR	SR	S	%R	Action

Matrix Spike Actions apply to all samples of the same matrix.

ACTIONS:

- 1. If the sample concentration exceeds the spike concentration by a factor of 4 or more, no action is taken.
- 2. If any analyte does not meet the %R criteria follow the actions stated below:

	Percent Recovery			
	< 30%	30% - 69%	> 130%	
Positive Sample Results	J	J	J	
Non-detected Results	R	UJ	A	

2. Frequency Criteria

- A. Was a matrix spike prepared at the required frequency? Yes or No
- B. Was a post digestion spike analyzed for elements that did not meet required criteria for matrix spike recovery? *Not applicable.* Yes or No

A separate worksheet should be used for each matrix spike pair.

413.1 & 418.1 Data Review Worksheets, BARNES BUILDING, J.O. # 05000.24 Page 8

IV. LABORATORY CONTROL SAMPLE

(ALL CRITERIA MET.)

1. Aqueous LCS Laboratory Acceptance Criteria 85-115% Recovery.

LCS not reported for 413.1.

List any LCS recoveries not within the 85-115% criteria and the samples affected.

Date	Analyte	%R	Action	Samples Affected
12/26/96	418.1	99%	none	
12/31/96	413.1	NA	J	All Samples
	,			
	<u> </u>			

2. Solids LCS None Analyzed

List any analytes that were not within the control windows set by the EPA for the solid LCS sample. The 85-115% criteria is not used to evaluate solid LCS results.

Element	LCS Conc.	Control Windows	Action	Samples Affected

ACTIONS:

		Percent Recovery				
Aqueous LCS	< 50%	50% - 84%	> 115%			
Positive Results	R	J	J			
Non-detected Results	R	UJ	Α			
Solid LCS	<epa control="" td="" window<=""><td>vs >EPA (</td><td>Control Windows</td></epa>	vs >EPA (Control Windows			
Positive Results	J		J			

3. Frequency Criteria

Non-detected Results

A. Was an LCS analyzed for every matrix, every digestion batch, every 20 samples?

UJ

Yes or No

Α

VIII. LABORATORY DUPLICATES

List the concentrations of all analytes in the laboratory duplicate pair. Indicate what criteria was used to evaluate the precision by circling either the RPD or reporting limit for each element.

	Reportin	g Limits				
			C14	D11		
	Water	Soil	Sample #	Duplicate #		
Analyte	mg/L	mg/kg	1SW2X	1SW2XDUP	RPD	Action
413.1	1		4	6	40	none
418.1	I		none	none	NC	none
						-
			<u></u>			ļ
						
				<u>. </u>		
	ļ					
						-
					 	
		<u> </u>				
	1					

Laboratory duplicate actions should be applied to all other samples of the same matrix type.

ACTIONS:1

- 1. Estimate (J) positive results for analytes which have an RPD >30% for waters and >30% for soils.
- 2. If sample results are less than 10x the reporting limit, estimate (J) positive results for analytes whose absolute difference is > 2x the reporting limit. If both samples are non-detected, the RPD is not calculated (NC).

Matrix:

Water

IX. FIELD DUPLICATES

List the concentrations of all analytes in the field duplicate pair. Indicate what criteria was used to evaluate the precision by circling either the RPD or reporting limit for each element.

				IVI	latrix:	water
	Reportir	ng Limits	-	-		
	Water	Soil	Sample #	Duplicate #		
Analyte	mg/L	mg/kg	ISW2X	ISW2D	RPD	Action
413.1	1		4	6		none
418.1	1		6	7		none
						··
 						
						· · · · · · · · · · · · · · · · · · ·
		-	* • •	<u> </u>		
		 -				

Field Duplicate Actions should be applied to all other samples of the same matrix type.

ACTIONS: None

- 1. Estimate (J) positive results for elements which have an RPD >20% for waters and >20% for soils.
- 2. If sample results are less than 5x the reporting limit, estimate (J) positive results for elements whose absolute difference is >2x reporting limit, (4x reporting limit for soils). If both samples are non-detected, the RPD is not calculated (NC).

Water

X. HOLDING TIMES

Complete table for all samples and circle the analysis data for samples not within criteria.

		413.1	418.1	Others Date	pl	Н	
		Date	Date				
Sample ID	Date	Analysis	Analysis	Analysis	413.1	CN	Action
	Sampled			<u></u>	418.1		ļ
ISW2X	12/12/96	12/31/96	12/26/96	NR	<2	NA	None
ISW2D	12/12/96	12/31/96	12/26/96	NR	<2	NA	None
1SW1X	12/12/96	12/31/96	12/26/96	NR	<2	N.A	None
	-						
	1						

Metals - 180 days from sample collection
Mercury - 28 days from sample collection
Cyanide - 14 days from sample collection

ACTION: Mercury MSD sample was analyzed outside the holding time. Sample and MS were analyzed within hold times. results are not qualified.

- 1. If holding times are exceeded all positive results are estimated (J) and non-detects are estimated (UJ).
- 2. If holding times are grossly exceeded, the reviewer may determine that non-detects are unusable (R).

M = Metals

INORGANIC REGIONAL DATA ASSESSMENT

Project Nam Barnes Building Project	No. of Samples: 3
Project Location: Massachusetts	Matrix: Water
Stone & Webster Subcontract #: J.O#05000.24	Reviewer: Kestrel Env. Tech., Inc.
Contact No. <i>DACW33-94-D-0007</i>	Reviewer's Name: D.L. Smith
Laboratory: Mitkem	Completion Date 02/27/97

SDG BARNES BUILDING PROJECT DATA ASSESSMENT SUMMARY

		413.1	418.1	
1.	Holding Times	A	A	
2.	Blanks	A	A	
3.	LCS	M	A	
4.	Duplicate Analysis	A	A	
5.	Matrix Spike	M	A	
6.	Other QC	A	A	
7.	Overall	M	A	
	Assessment			

- Λ = Accept all data without qualification. No problems encountered.
- N = Data qualified due to minor problems.
- M = Data qualified due to major problems.
- Z = Data unacceptable.
- X = Problems, but do not affect data.

Actions Items: 413.1 results qualified J because no LCS and MS/MSD results reported. Results for 413.1 not rejected because 418.1 results and Mass VPH/EPH data support the 413.1 results.

Areas of Concern:. Instrument run logs not submitted, LCS and MS/MSD results not reported for 413.1. Actual spike concentrations not reported, only % recoveries.

INORGANIC ANALYSIS (KESTREL)

February 26, 1997

Mr. Kevin Scully: Stone & Webster Environmental Technology & Services 245 Summer Street Boston, MA 02210

RE: Contract/Work Assignment #: DACW33-94-D-007

Inorganic Data Validation Letter Report, J.O.#: 05000.24

Stone & Webster Subcontract #: PS-029471

Lab Name: Mitkem, Warwick R.I.. Site Name: Barnes Building Project.

Inorganic Analysis

Samples Collected: 3 water samples analyzed for 13 priority pollutant elements.

1SW2X collected 12/12/96 1SW2XD collected 12/12/96 1SW1X collected 10/31/96

Dear Mr. Scully:

The requirements of this data validation are specified in the 16 August 1989 memorandum from CEMRD-ED-GC. This data validation was performed on the inorganic analytical data from samples collected by Stone and Webster at the Barnes Building Project Site. The laboratory, Mitkem, (Warwick R.I), prepared and analyzed the samples in accordance with US EPA 6010A methods for ICP, and method 7470, Mercury Cold Vapor analyses. The data were evaluated based on the following parameters in accordance with project specific guidelines and standard USEPA data validation guidelines:

Chain of custody documents

Sample log-in documents

Trip blanks, field blanks, and method blanks

MS/MSD results

- *LCS/LCSD results
- *Field duplicate results
- *Laboratory duplicate results

Holding Times

* All criteria were met for these parameters.

Chain of Custody and Sample Log In Documents

Laboratory cooler receipt documentation was in order. The laboratory should record the actual sample pHs upon sample receipt. According to the sample log in documentation sample preservatives were present in the samples.

Trip Blanks, Field Blanks, and Method Blanks

No equipment blank results were reported.

Antimony and copper prep blank results are above the instrument IDL. Antimony and copper results are undetected at elevated reporting levels, 15ug/L and 25ug/L respectively.

Initial calibration blank and continuing calibration blank information were not included in the data package.

MS/MSD Results

Sample 1SW2X was selected as the MS/MSD sample. MSD recoveries for beryllium, chromium, copper, and zinc were greater than 120%. Sample results were undetected, therefore results are unqualified. The MSD for mercury was 6 days outside of the required hold time. The sample and MS were analyzed within the hold time, therefore the data are reported as unqualified.

Holding Times

The mercury MSD sample was analyzed outside the method hold time. The sample and MS were analyzed within the holding time. The mercury sample result is not qualified.

Summary

A summary of the above findings as well as additional comments not previously addressed in this memorandum are included in this summary section.

Preparation blank results indicate antimony and copper results above the IDL. The copper prep blank result is equal to the reporting limit. The reported values for antimony and copper are 15ug/L and 25ug/L respectively, based upon the prep blank results.

The MSD results for beryllium, chromium, copper, and zinc are greater than 120%. The sample result are undetected, therefore the data are not qualified. Any positive result would be biased high.

The mercury MSD was analyzed outside the sample holding time. The sample and MS were analyzed within the holding time. The sample result is accepted as unqualified.

Insufficient documentation is available to determine if calibration blanks were run every 2 hours because instrument run logs were not included in this package.

Table 1 summarizes the validated sample results for the Barnes Building Project. The inorganic data review worksheets are appended to this package.

Sincerely.

Kestrel Environmental Technologies, Inc.

Deborah L. Smith

President

while I hill

Barnes Building Project Elements Recommendations Summary

Element	Qualifier
Antimony	A
Arsenic	A
Beryllium	A
Cadmium	A
Chromium	A
Copper	A
Lead	A
Mercury	A
Nickel	A
Selenium	A
Silver	A
Thallium	A
Zinc	A

A - Accept all data.

TABLE I

Inorganic Validated Results

Project #: SDG:

J.O. #: 05000.24 Laboratory: Mitkem

Site. Barnes Building

S&W Samp	ole ID		ISW2X	1SW2D	18W1X	
Lah Sample Ni	ımber:		C1515-01	C1515-02	C1515-03	
Sample Typ	æ:		Surface Water	Surface Water	Surface Water	
Matrix:			water	water	water	
Dilution Fa	ctor:					
Dilution Fa	ctor:					
Dilution Fa	ctor:					
Dilution Fa	ctor:					
Date Sampl	ed:		12/12/96	12/12/96	12/12/96	
Percent Sol	ids:		0,0	0.0	0.0	
Notes:						
Element	IDL	Method	ug/L	ug/L	ug/L	
Antimony	3	P	15U	15U	15U	
Arsenic	2	Р	2U	2U	2U	
Beryllium	0.2	Р	0.2U	0.2U	0, 2 U	
Cadmium	0,2	Р	0.2U	0.2U	0.2U	
Chromium	0.3	Р	0.3U	0.3U	0,3U	
Copper	1	P	25U	25U	25U	
Lead	1	P	1U	IU	10	
Mercury	0.09	CV	0,09U	0.09U	0.09U	
Nickel	Ţ	Р	IU	1U	ΙÜ	
Selenium	5	Р	5U	5U	5U	
Silver	2	Р	2U	2U	2U	
Thallium	3	Р	3U	3U	3U	
Zinc	1	Р	1U	1U	160	

Analytical Method:

G - Furnace AA PM - ICP/Microwave Digestion
P - ICP (6010A) FM - Furnace AA/Microwave Digest.
CV - Manual Cold Vapor (7470) PM - ICP/Microwave Digestion

Note:

- J Quantitation is approximate due to limitations identified in the quality control review (Date Review).
- U The compound was not detected. The associated numerical value is the compound quantitation limit
- UJ The compound was not detected. The compound quantitation limit is an estimated value.
- R Value is rejected.

DATA REVIEW WORKSHEETS

Project Name:	Barnes Build	ing	J.O. 050	000.24			
Location:	Massachusetts		Project Number PS-029471				
		REVIEW OF I	· · · · · · · · · · · · · ·				
The hardcopied has been review included:			Mitkem erformance data sum	data package marized. The data review			
_ <i>Te</i>	estrel Environn chnologies, Inc	:Samplin	g Date(s) <u>12/12/96</u>				
	D.L. Smith		g Date(s) 12/12/96				
No. of Samples.	iviatrix 3 n	^l ater	Date Rec'd by Lab	12/13/96			
Sample Identifie	ers:						
1.SW	'2X	1SW2D	ISWIX				
Field Dup Nos.:	······································		PA 6010A ICP metho	ods and 7470 Mercury.			
The general cri	teria used to de	termine system perf	ormance were based	on an examination of:			
- Samp - Field - Trip :	n of Custody ble Log-in Doci Rinsate Blanks Blanks od Blanks	iments -	Matrix Spike Blank Spikes (LCS/L Laboratory Duplicate Field Sample Duplica Holding Times	es			
Overall Comm prep blank resu		blank not collected.	Antimony and copper re	esults qualified due 10			
Definitions and	l Qualifiers:						
	ate data due to a due to quality ot detected.	quality control criter control criteria.	/	Date: 2/26/97			

Page 2

I. CHAIN OF CUSTODY AND SAMPLE LOG-IN DOCUMENTS

Are all samples identified on the chain of custody?	YES	NO
Are sample dates and appropriate signatures present?	YES	NO
Were the samples containers intact?	YES	NO
Were the samples preserved according to protocol?	YES	NO
Were custody seals present and intact?	YES	NO
Were the samples clearly and accurately labeled?	YES	NO

Explain any deviations:

Chain of custody forms indicate that sample preservatives were added to appropriate sample containers. Sample log in forms do not indicate that the sample pHs were checked for the elements samples. This should be a routine practice.

II A. BLANK ANALYSIS RESULTS (Section 1-3)

List the blank contamination in Sections 1 & 2 below. A separate worksheet should be used for soil and water blanks.

1,	Laboratory Bl	anks Matrix:)	Water	

Date	ICB/CCB#	Prep BL	Analyte	Conc./Units
12/19/96		1219PBW	Antimony	3 ug/L 5 ug/L
12/19/96		1219PBW	Antimony Copper	5 ug/L
·, <u> </u>				<u> </u>
				·
, , <u>, , , , , , , , , , , , , , , , , </u>				
				<u> </u>
				

2	Fauir	mant/	Trin	Blanks	иома	auhm	ittad
Z.	Equip.	menv	Frib	Dianks	none	suom	шеа

Date	Equipment Blank No.	Analyte	Conc./Units
**			
<u> </u>			
<u>-</u>			

3. Frequency Requirements

A. Was a preparation blank a	nalyzed for each matrix, for every 20 sample:	S		
and for each digestion bat	ch?	Yes	or	No
B. Was a calibration blank ru	in every 10 samples or every 2 hours which			
ever is more frequent?	Unknown, insufficient documentation.	Yes	ог	No

If No.

The data may be affected. Use professional judgment to determine the severity of the effect and qualify the data accordingly. Discuss any actions below, and list the samples affected.

ICB and CCB results were not submitted.

Water

Matrix:

II B. BLANK ANALYSIS RESULTS (Section 4)

4. Blank Actions

The Action Levels for any analyte is equal to five times the highest concentration of that element's contamination in any blank. The action level for samples which have been concentrated or diluted should be multiplied by the concentration/dilution factor. No positive sample result should be reported unless the concentration of the analyte in the sample exceeds the Action Level (ΛL) . Specific actions are as follows:

- 1. When the concentration is greater than the IDL, but less than the Action Level, report the sample concentration detected with a U.
- 2. When the sample concentration is greater than the Action Level, report the sample concentration unqualified.

Matrix:	Soil	Matrix:	Aqueous

Element	Max. Conc./ Units	AL/ Units
		_

Max. Conc./ Units	AL/ Units
3.0 ug/L	15.0 ug/L
5.0 ug/L	25.0 ug/L
· · · · · · · · · · · · · · · · · · ·	
	Units 3.0 ug/L

NOTE: Blanks analyzed during a soil case must be converted to mg/kg in order to compare them with the sample results.

Conc. in
$$\mu g/L \times \frac{\text{Volume diluted to (mls)}}{\text{Weight digested (gm)}} \times \frac{1L}{1000 \text{ml}} \times \frac{1000 \text{gm}}{1 \text{kg}} \times \frac{1 \text{mg}}{1000 \mu \text{g}} = \text{mg/kg}$$

Multiplying this result by 5 to arrive at the action level gives a final result in mg/kg which can then be compared to sample results.

List the percent recoveries for analytes which did not meet the required criteria.

S - amount of spike added SSR - spikes sample result SR - sample result

Analyte	SSR	SR	S	%R	Action
None			- 10		
					-
			<u> </u>		

Matrix Spike Actions apply to all samples of the same matrix.

ACTIONS:

- 1. If the sample concentration exceeds the spike concentration by a factor of 4 or more, no action is taken.
- 2. If any analyte does not meet the %R criteria follow the actions stated below:

		Percent Recovery				
	< 30%	30% - 79% (74%)	> 120% (125%)			
Positive Sample Results	J	J	J			
Non-detected Results	R	UJ	Α			

- 2. Frequency Criteria
 - A. Was a matrix spike prepared at the required frequency?

 Yes

 or
 - B. Was a post digestion spike analyzed for elements that did not meet required criteria for matrix spike recovery? *Not applicable.* Yes or No

A separate worksheet should be used for each matrix spike pair.

No

III. MATRIX SPIKE DUPLICATE

Sample ID 1SW2XMSD Matrix: Water

1. Recovery Criteria Laboratory Acceptance Criteria:80-120% for ICP and CVAA 75-125% for GFAA

List the percent recoveries for analytes which did not meet the required criteria.

S - amount of spike added not reported

SSR - spikes sample result not reported

SR - sample result

Analyte	SSR	SR	S	%R	Action
Beryllium			$\theta.2U$	122	A
Chromium			0.3U	121	A
Copper			IU	134	A
Zinc			IU	127	A

Matrix Spike Actions apply to all samples of the same matrix.

ACTIONS:

- 1. If the sample concentration exceeds the spike concentration by a factor of 4 or more, no action is taken.
- 2. If any analyte does not meet the %R criteria follow the actions stated below:

	Percent Recovery			
	< 30%	30% - 79% (74%)	> 120% (125%)	
Positive Sample Results	J	J ***	J	
Non-detected Results	K	OJ	А	

- 2. Frequency Criteria
 - A. Was a matrix spike prepared at the required frequency? Yes or
 - B. Was a post digestion spike analyzed for elements that did not meet required criteria for matrix spike recovery? *Not applicable.* Yes or No

A separate worksheet should be used for each matrix spike pair.

No

Inorganic Data Review Worksheets, BARNES BUILDING, J.O. # 05000.24 Page 8

IV. LABORATORY CONTROL SAMPLE

(ALL CRITERIA MET.)

1. Aqueous LCS Laboratory Acceptance Criteria 85-115% Recovery.

List any LCS recoveries not within the 85-115% criteria and the samples affected.

Date	Element	%R	Action	Samples Affected
12/19/96	all criteria met			
01/15/97	all criteria met			
	· " • " · " · " · " · · · · · · · · · ·			

2. Solids LCS None Analyzed

List any analytes that were not within the control windows set by the EPA for the solid LCS sample. The 85-115% criteria is not used to evaluate solid LCS results.

Element	LCS Conc.	Control Windows	Action	Samples Affected

ACTIONS:

	Percent Recovery					
Aqueous LCS	< 50%	50% - 84%	> 115%			
Positive Results	R	J	J			
Non-detected Results	R	UJ	Α			
Solid LCS	<epa control="" td="" windows<=""><td> >EPA (</td><td>Control Windows</td></epa>	>EPA (Control Windows			
Positive Results	J		J			

3. Frequency Criteria

Non-detected Results

A. Was an LCS analyzed for every matrix, every digestion batch, every 20 samples?

UJ

	_	
Yes	or	No

Α

VIII. LABORATORY DUPLICATES

5

2

3

ļ

Reporting Limits

List the concentrations of all analytes in the laboratory duplicate pair. Indicate what criteria was used to evaluate the precision by circling either the RPD or reporting limit for each element.

	1 Reportin	15 Dimins	113			
	Water	Soil	Sample #	Duplicate #		
Element	ug/L	mg/kg	1SW2X	1SW2XDUP	RPD	Action
Aluminum						
Antimony	3		3U	3U	NC	none
Arsenic	2		2U	2U	NC	none
Barium					NC	none
Beryllium	0.2		0.2U	0.2U		
Cadmium	0.2		0.2U	0.2U	NC	none
Calcium						Ī
Chromium	0.3		0.3U	0.3U	NC	none
Cobalt						
Copper	I		<i>IU</i>	1U	NC	none
Iron						
Lead	<u>l</u>		1U	IU IU	NC	none
Magnesium						
Manganese						
Mercury	0.09	<u> </u>	0.09U	0.09U	NC	none
	1	1				

Laboratory duplicate actions should be applied to all other samples of the same matrix type.

IU

5U

2U

3U

IU

ACTIONS:1

Nickel

Silver

Sodium Thallium

Vanadium Zinc

Cyanide

Potassium Selenium

- 1. Estimate (J) positive results for elements which have an RPD >20% for waters and >20% for soils.
- 2. If sample results are less than 5x the reporting limit, estimate (J) positive results for elements whose absolute difference is > reporting limit, (2x reporting limit for soils). If both samples are non-detected, the RPD is not calculated (NC).

IU

5U

 $2U_{\cdot}$

3U

IU

NC.

NC

NC

NC

NC

none

none

none

none

none

IX. FIELD DUPLICATES

List the concentrations of all analytes in the field duplicate pair. Indicate what criteria was used to evaluate the precision by circling either the RPD or reporting limit for each element.

]	Matrix:	Water
	Reportir	ıg Limits				
	Water	Soil	Sample #	Duplicate #		
Element	ug/L	mg/kg	ISW2X	ISW2D	RPD	Action
Aluminum						
Antimony	3		3U	4	NC	none
Arsenic	2		5 U	5 U	NC	none
Barium						
Beryllium	0.2		0.2U	0.2U	NC	none
Cadmium	0.2		0.2U	0.2U	NC	none
Calcium						
Chromium	0.3		0.3U	0.3U	NC	none
Cobalt						
Copper	11			IU	NC	none
Iron						
Lead			<u> 1U </u>	1U	NC	none
Magnesium			#11 ·			
Manganese						
Mercury	0.09		0.09U	0.09U	NC	none
Nickel	1	<u> </u>	1U	1U	NC	none
Potassium						
Selenium	5		5 U	5 U	NC	none
Silver	2		5 U	5 U	NC	none
Sodium						
Thallium			· · · · · · · · · · · · · · · · · · ·			
Vanadium	<u> </u>	<u> </u>				
Zinc	1	<u> </u>	<u> 1U</u>	<u>1U</u>	NC	none
Cyanide						

Field Duplicate Actions should be applied to all other samples of the same matrix type.

ACTIONS: None

- 1. Estimate (J) positive results for elements which have an RPD >20% for waters and >20% for soils.
- 2. If sample results are less than 5x the reporting limit, estimate (J) positive results for elements whose absolute difference is >2x reporting limit, (4x reporting limit for soils). If both samples are non-detected, the RPD is not calculated (NC).

X. HOLDING TIMES

Complete table for all samples and circle the analysis data for samples not within criteria.

		Hg Date	Cyanide Date	Others Date	р	Н	
Sample ID	Date Sampled	Analysis	Analysis	Analysis	M	CN	Action
ISW2X	12/12/96	12/30/96	NA	NR	<2	NA	None
ISW2D	12/12/96	12/30/96	NA	NR	<2	NA	None
ISWIX	12/12/96	12/30/96	NA	NR	<2	N.4	None
					<u></u>		
					,		
						-	

Metals - 180 days from sample collection
Mercury - 28 days from sample collection
Cyanide - 14 days from sample collection

ACTION: Mercury MSD sample was analyzed outside the holding time. Sample and MS were analyzed within hold times. Results are not qualified.

- 1. If holding times are exceeded all positive results are estimated (J) and non-detects are estimated (UJ).
- 2. If holding times are grossly exceeded, the reviewer may determine that non-detects are unusable (R).

M = Metals

INORGANIC REGIONAL DATA ASSESSMENT

Project Nam Barnes Building Project	No. of Samples: 3
Project Location: Massachusetts	Matrix: Water
Stone & Webster Subcontract #: J.O#05000.24	Reviewer: Kestrel Env. Tech., Inc.
Project No. PS-029471	Reviewer's Name: D.L. Smith
Laboratory: Mitkem	Completion Date 02/27/97

BARNES BUILDING PROJECT DATA ASSESSMENT SUMMARY

		ICP	GFAA	Hg	
1.	Holding Times	A	NR	Α	
2.	Blanks	N	NR	A	
3.	LCS		NR	A	
4.	Duplicate Analysis	A	NR	A	
5.	Matrix Spike	A	NR	A	
6.	Other QC	A	NR	A	
7.	Overall	A	NR	A	
	Assessment				

- A = Accept all data without qualification. No problems encountered.
- N = Data qualified due to minor problems.
- M = Data qualified due to major problems.
- Z = Data unacceptable.
- X = Problems, but do not affect data.

Actions Items: Antimony and copper concentrations in the prep blank are greater than the instrument detection limits Antimony results below 15ug/L are reported as undetected. Copper results below 25ug/L are reported as undetected.

Areas of Concern:. Instrument run logs not submitted

APPENDIX E

FIELD SAMPLING DATA SHEETS

DAILY QUALITY CONTROL REPORT

	DATE		12/1-	496		
REPORT NUMBER:	Day	S	M T	W	x f	S
COE ENGINEERING MANAGER:	,	Bright	i ow i	Ortrans	-	: Snee
PROJECT: BARNES Blog	Weather	To 32	22-10	30-70	X 1 79-41	45 Up
JOB NUMBER: ()5060 24	Temperature		K			
CONTRACT NUMBER:	Wind			Hør ————————————————————————————————————	-	FT NA
	Humidity	Dry		X		
SUB-CONTRACTORS ON SITE: None						
EQUIPMENT ON SITE: PID LELIUS PH, TE	mp, Cord	Me	ter.			
Low 9ow 66 Samples	 -					
WORK PERFORMED (INCLUDING SAMPLING)						
system on.	Room	ed_	ve	ntel	ut i	6 7)
Samples Conected From	each our	10	<u> </u>	al	/w	F
seperator			7			
0-1' on 0,1 side						
1-2' on water side			-			
Vent on Au Sample began	8070					
Collected Oil-Side Swamp Som	2012	/61	9			
CONTRACTOR CONTRACTOR	pleso e	101	<u></u>			
						<u></u> :
				_		
			· · · ·			

DATE 12/12/46 JOB NUMBER: 0500024 QUALITY CONTROL ACTIVITIES (INCLUDING FIELD CALIBRATIONS) Collebrated PID

Collebrated pto metar Tempo + Conductivity are

Factory calibrated

LEL/O, requires collebration monthly HEALTH AND SAFETY LEVELS AND ACTIVITIES (DAILY HEALTH AND SAFETY AUDIT ATTACHED) H+S kvel D w/ Tyrek to protest Clother PROBLEMS ENCOUNTERED/CORRECTION ACTION TAKEN: Work Plan specified that EPH sample be preserved. WHCL. Sample for the from Mitten did not take the in them (EPH). Called Mitten & spoke w/ Marke Shippie he Told me that 294 does not require preserved to the collect unpreserved to the samples warm bottles provided. (will the surples for shipping) SPECIAL NOTES TOMORROW'S EXPECTATIONS

BY _____TITLE _____

REPORT NUMBER: ____

SHEET 3 OF 3

PROJECT: Breneo Bldg

STONE & WEBSTER ENVIRONMENTAL TECHNOLOGY & SERVICES FIELD DATA RECORD

Project 2	alnes,	Bldg		10.No.: 050	50024
Sample ID				Date: /7	2/12/96
Circle One	Soil	Surface Water		Project Activity:	Sump & AIR Sampling
	Groundwater	Sediment			9
☐ Seld Dur	plicate Collected	AIR Samples	es	Duolicase ID No.	
				Octoicas ID No.	
Color	BSERVATION	15		Odor?	
Grain Size				PID Reading:	
Saturated?				Other:	
WATER LEV	/EL/WELL D	ATA			
A Well Depth (FT)			at Well Deoth (I	<u>Fn:</u>	K, Well Locked?
8 Death To Water	<i>(</i> Fn):	G. Measun	ed From:	Riser / Casing	L Protective Casing Secure?
C Height of Water	(FT):	H. Casing	Stick-up (FT):		M. Gravel Pad ireact?
0 Well ID:		I. Diff Wei	and Casing (FI):	N. Well Marlongs Readable?
E Volume (GAL);		J. Purge V	olume (GAL):		
EQUIPMENT	DOCUMEN	TATION SAMPLING			DECONTAMENATION FILLIDS USED
PID		Botti	_		Liquinox
Dust Monitor		[Z] Bom			Distilled Water
Explosimeter		Cther			Lab Provided Blank Water
Other					Potable Water
ANALYTICAL	DADAM	TEOC		·	Methanot
YPE	PARAMET METHOD	FLTERED?	VOLUME	PRESERVED	Cther:
TH S!					QA/QC DATA
VOCs					QA Samole Taken? Ye. S
SVOCs					1510
Metals					OC Sample Taken?
Pest/PCB					ID:
Other:					
URGE DATA					NOTES:
olume	FIRST VOLUME	SECOND VOLUME	11 -8 8	DVOLUME	
emp (C)	<u> </u>				
) '		 			S. P. Walder
ona -					
urb					
<u> </u>					Figure 4
horodraph taxen et	Weil Waler after f	Final Well Development?			Field Data Recor

Project <u>COE</u> - BAR Job No. <u>0500624</u>		oldg	
Date 12/12/96			
Field Instrumentation Calibration Da	ata		
Equipment Type/I.D.	Battery Condition	Calibration Information	
er# 9605 Beta Tech pH, Temp, Cond	Eoc d	pH4 pH7	·
		pH 4 pH 7	pH 10
		Cond. Std/ Cond. Std/ Cond. Std/	Cond. Std/
Dissolved Oxygen	,		pm Meter Valueppm
Redox		Zorbeit Sol. Value	-
Photoionization Meter OVM Datalogge 560B	Good	Zero/Zero Air? 2 Yes Q No	Span Gas Value / ppm Equi
		Zero/Zero Air? 🖸 Yeu 🖸 No	Mater Valueppm Equi Span Gas Valueppm Equi Meter Valueppm Equi
Other			
Fluids/Materials Record			
Deionized Water Source: [] Staging Trip Blank Water Source: [] Lab; Lot No.	•		
Decontamination Fluids: [] Methyl Hydra Sampler Blank Water Source: [] Staging			Lot No
HNO ³ /DI Rinse Solution: Staging; I.D. No Preservation Chemical Lot I.D.s: Chemicals L			~ `
		No	
		No t No	
Filtration Paper ID: Manuf/Type	0		
Let No	Sampler Si	gnature	Figure 4-1

Colibration Data Sheet

Manuf.__

CONTRACTOR CHEMICAL QUALITY CONTROL CHECKLIST

	This c	hecklist is to be provided by the CQC to insure that all required documents and forms are present onsite.
		Checklist for field equipment and other materials: During preliminary site activities, prior to mobilization to the site, Tables 4-2 and 4-3 will be reviewed and the specified equipment and supplies will be obtained. All instruments will be accompanied with instrument operating manuals.
		Contract Specifications: Copies of all subcontract agreements with contact name and phone number.
		☐ Analytical Laboratory
		Contract Plans
		Sufficient copies of the SSHP and required forms for the field team.
,	Ø	Sampling and Analysis Plan: One copy of the complete SAP, including the FSP and QAPP.
		Example Tables for Recording Data: The following is a listing of example blank forms to be completed while onsite. Figure numbers correspond to those used in the FSP: Calibration Data Sheet (Figure 4-1)
		Field Data Record (Figure 4-2)
		Daily Chemical Quality Control Report (Figure 5-1)
		Chain of Custody Record (Figure 5-2)
		☐ Laboratory Cooler Receipt Form (Figure 6-1)

lob No. 05000.24	<u> </u>		
Date 12/13/96			
ield Instrumentation Calibration	n Data		
Equipment Type/I.D.	Battery Condition	Calibration Informatio	n
		pH4 pH7	pH 10
	•··	pH 4 pH 7	pH 10
		pH 4 pH 7	pH 10
		Cond. Std/	Cond. Std/
	 .	Cond. Std//	
	<u> </u>	Cond. Std/	Cond. Std/
Dissolved Oxygen	•		
		Avg. Winkler Value	ppm Meter Value
Redox			
		Zorbeli Sol, Value	Meter Value
Photoionization Meter			
-		Zero/Zero Air? 🔾 Yes 🔾 No	o Soan Gas Value 💢 📆
			Meter Valuepp
		Zero/Zero Air? ☐ Yes ☐ No	
		2010250 At: 4 165 4 16	Meter Valuepp
Other		4	######################################
ESD Model 800 Turb. Mete	Dead Plyt	zeroed unit u	sing DI water
CAN LONG TO THE PARTY OF THE PA	, AC		
uids/Materials Record	, AC		
uids/Materials Record	Portable :	System [] Other	
uids/Materials Record Deionized Water Source: [] Staging	• •	,	
uids/Materials Record Deionized Water Source: [] Staging Trip Blank Water Source: [] Lab; Lot I	No	[] Other, ID	· · · · · · · · · · · · · · · · · · ·
Uids/Materials Record Deionized Water Source: [] Staging Trip Blank Water Source: [] Lab; Lot I Decontamination Fluids: [] Methyl H	Noyarate; Lot No	[] Other; ID [] Other	Lot No
uids/Materials Record Deionized Water Source: [] Staging Trip Blank Water Source: [] Lab; Lot I Decontamination Fluids: [] Methyl H Sampler Blank Water Source: [] Staging	vorate; Lot No ng [] Port .Syste	[] Other, ID	Lot No
Uids/Materials Record Deionized Water Source: [] Staging Trip Blank Water Source: [] Lab; Lot I Decontamination Fluids: [] Methyl H	yorate: Lot No ng [] Port .Syste	[] Other; ID	Lot No
uids/Materials Record Deionized Water Source: [] Staging Trip Blank Water Source: [] Lab; Lot I Decontamination Fluids: [] Methyl H Sampler Blank Water Source: [] Staging HNO ³ /DI Flinse Solution: Staging; I.D. N	No	[] Other; ID	Lot No
uids/Materials Record Deionized Water Source: [] Staging Trip Blank Water Source: [] Lab; Lot I Decontamination Fluids: [] Methyl H Sampler Blank Water Source: [] Staging HNO ³ /DI Flinse Solution: Staging; I.D. N	yorate; Lot No ng [] Port .Syste lo els Used: HNO*Lot HFSO*Lo	[] Other; ID [] Other m [] Other No it No	Lot No
uids/Materials Record Deionized Water Source: [] Staging Trip Blank Water Source: [] Lab; Lot I Decontamination Fluids: [] Methyl H Sampler Blank Water Source: [] Staging HNO ³ /DI Flinse Solution: Staging; I.D. N	yorate; Lot No ng [] Port .Syste lo els Used: HNO*Lot H*SO*Lo HCL Lot N	[] Other; ID [] Other m [] Other No	Lot No
uids/Materials Record Deionized Water Source: [] Staging Trip Blank Water Source: [] Lab; Lot I Decontamination Fluids: [] Methyl H Sampler Blank Water Source: [] Staging HNO ³ /DI Flinse Solution: Staging; I.D. N	yorate; Lot No ng [] Port .Syste to els Used: HNO*Lot HFSO*Lo HCL Lot NeOH Lo	[] Other; ID	Lot No
uids/Materials Record Deionized Water Source: [] Staging Trip Blank Water Source: [] Lab; Lot I Decontamination Fluids: [] Methyl H Sampler Blank Water Source: [] Staging HNO ³ /DI Flinse Solution: Staging; I.D. N	yorate; Lot No ng [] Port .Syste to els Used: HNO*Lot HFSO*Lo HCL Lot NeOH Lo	[] Other; ID [] Other m [] Other No t No t No t No	Lot No
uids/Materials Record Deionized Water Source: [] Staging Trip Blank Water Source: [] Lab; Lot if Decontamination Fluids: [] Methyl H Sampler Blank Water Source: [] Stagin HNO³/DI Rinse Solution: Staging; I.D. N Preservation Chemical Lot I.D.s: Chemical	yorate; Lot No ng [] Port .Syste lo els Used: HNO*Lot HP SO* Lo HCL Lot N NaOH Lo ZnAOC L	[] Other; ID [] Other m [] Other No t No t No t No	Lot No.

DAILY QUALITY CONTROL REPORT

	DATE	17	/13/	96		
REPORT NUMBER:	 Day	S	H Y	W	1 1	(s
COE ENGINEERING MANAGER:	_					
PROJECT: Barnes Building Sump Room	Weather	bright Swn	Case	CHAPPEN	Phase	5444
JOB NUMBER: 05006.24	Temperature	Te 32	23.50	30-70	79-45	£3 Up
CONTRACT NUMBER:	Wind	Calvin	Adamster 1	High	-	ri Ng
	Humidity	Dry	11-1-1-1-1	Нgr		
SUB-CONTRACTORS ON SITE:						
EQUIPMENT ON SITE:						
						<u>-</u> .
WORK PERFORMED (INCLUDING SAMPLING)		<u> </u>			, ,	
and one from water side.	sump room.	ne	Fran	00	510	
	from sump	108	m	when		
Ventilation system is Off. Sample I.D	. 1AR1x					
Set up time to collect sample for	rom Boiler R	2014	. S a	uple	I.D	.
3AR3X						
				**.		
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		•				-a ·
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SHEET 1 OF 3

	REPORT NUMBER:
JOB NUMBER:	DATE
QUALITY CONTROL ACTIVITIES (INCLUDING	FIELD CALIBRATIONS)
Calibrated Turbidgy meter	usung Dit. Water.
HEALTH AND SAFETY LEVELS AND ACTIVITY	ES (DAILY HEALTH AND SAFETY AUDIT ATTACHED)
THE CONTROL OF THE CASE OF THE PARTY AND ACTIVITY	ES (DAILT HEALTH AND SAFETY AUDIT ATTACHED)
PROBLEMS ENCOUNTERED/CORRECTION A	CTION TAKEN
	ad. Found power source to plug into.
12.014	as. Pours power 280.70 10 pray 1740.
	
CRECIAL MOTES	
SPECIAL NOTES	
SPECIAL NOTES TOMORROW'S EXPECTATIONS	

BY__

TILE.